

EXHIBIT E

**UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

HEADWATER RESEARCH LLC,

Plaintiff,

v.

SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA,
INC.,

Defendants.

Civil Action No. 2:22-cv-00422-JRG-RSP

JURY DEMANDED

**SAMSUNG ELECTRONICS CO. LTD. AND SAMSUNG
ELECTRONICS AMERICA, INC.'S P.R. 3-3 AND 3-4
INVALIDITY AND PATENT INELIGIBILITY CONTENTIONS**

Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Defendants” or “Samsung”) hereby provide the following Preliminary Invalidity Contentions (“Contentions”) to Plaintiff Headwater Research LLC (“Plaintiff” or “Headwater”) for U.S. Patent Nos. 9,137,701 (“the ’701 patent”), 9,271,184 (“the ’184 patent”), 9,521,578 (“the ’578 patent”), 9,277,445 (“the ’445 patent”), 11,495,224 (“the ’224 patent”), 9,143,976 (“the ’976 patent”), 9,277,433 (“the ’433 patent”), 9,609,544 (“the ’544 patent”), and 10,237,773 (“the ’773 patent”) (collectively, the “Asserted Patents”).

I. PRELIMINARY STATEMENT AND RESERVATION OF RIGHTS

In its Infringement Contentions dated February 28, 2023, Headwater asserted the following 198 claims (the “Asserted Claims”):

- Claims 1-25 of the ’701 patent;
- Claims 1-20 of the ’184 patent;
- Claims 1-22 of the ’578 patent;
- Claims 1-20, 22-26 of the ’445 patent;

- Claims 1-17 of the '224 patent;
- Claims 1-29 of the '976 patent;
- Claims 1-20 of the '433 patent;
- Claims 1-8 and 11-23 of the '544 patent; and
- Claims 1-14 and 16-20 of the '773 patent.

Samsung does not provide any Contentions directed to claims that Headwater has not asserted for purposes of infringement. To the extent Headwater may be permitted to assert additional claims in the future, Samsung reserves all rights to disclose new or supplemental contentions regarding such claims.

Because the same claim scope must apply for both infringement and invalidity, these Contentions are based on Headwater's assertions in its Infringement Contentions. Samsung does not thereby implicitly or explicitly agree with Headwater's construction of the claims. Samsung reserves all rights to disclose new or supplemental invalidity contentions, including to address any construction of the claims rendered by the Court, changed theories of infringement, and any evidence obtained during the course of discovery.

Subject to the rights reserved in these Contentions, all Asserted Claims are invalid under at least one or more of 35 U.S.C. §§ 101, 102, 103, and/or 112. The Asserted Claims are invalid because they are anticipated and/or rendered obvious under 35 U.S.C. §§ 102 and 103. If Headwater contends or a fact-finder finds that one or more limitations of the Asserted Claims are not disclosed in the prior art identified as anticipatory, Samsung reserves the right to assert obviousness based on the identified references and/or to identify other references that would have rendered obvious the allegedly missing limitation. Furthermore, the obviousness combinations of references provided below and in the accompanying claim charts under 35 U.S.C. § 103 are exemplary only and are not intended to be exhaustive. If or when Headwater challenges the

disclosure of any of these references with respect to particular limitations of the Asserted Claims, Samsung reserves the right to supplement these Contentions to assert additional or different bases for obviousness. Samsung reserves the right to use any combination of the references set forth in these Contentions to demonstrate the obviousness of the Asserted Claims. Additionally, certain claims of the Asserted Patents are invalid for failure to comply with the written description, enablement, and definiteness requirements of 35 U.S.C. § 112. The Asserted Claims are also invalid for lack of patentable subject matter under 35 U.S.C. § 101.

Samsung expressly reserves the right to amend, correct, and/or supplement these Contentions in accordance with the Procedural Schedule governing these cases.

* * *

These Contentions reflect Samsung's knowledge, investigation, and discovery as of the date of service. Samsung reserves the right to supplement these Contentions as appropriate and for any permissible reason. For example, pursuant to the Procedural Schedule, Samsung reserves the right to supplement these Contentions after subsequent case events, including any disclosure by Headwater of amended or supplemental infringement contentions, any ruling by the Court on claim construction, or in response to arguments made and positions taken by Headwater during fact and expert discovery. Samsung also reserves the right to supplement these Contentions if it becomes aware of additional prior art, becomes aware of additional features of the prior art references cited below, or becomes aware of any other relevant information through discovery, including non-party discovery, or otherwise. Samsung also reserves the right to modify or supplement its Contentions based on the Court's construction of the claims.

In addition to the charts attached hereto, Samsung expressly incorporates by reference, as if expressly set forth in these Contentions, all invalidity positions, prior art, and claim charts

asserted against Headwater in any Headwater lawsuit or IPR proceeding by Samsung, prior defendants, petitioners, and potential or actual licensees to the Asserted Patents. Samsung also incorporates any future discovery responses and expert reports in such litigations or proceedings.

Samsung's citations to disclosures in any particular prior art reference are not (and are not intended to be) exhaustive but rather illustrative. Samsung reserves the right to rely on uncited portions of the prior art references and on other publications and expert testimony as aids in understanding and interpreting the cited portions, as providing context thereto, as additional evidence that the prior art discloses a claim limitation or the alleged invention as a whole, as evidence of the state of the art at a particular time, as evidence of the obviousness factor of contemporaneous development by others, and as evidence of motivation to combine. Samsung also reserves the right to rely on uncited portions of the prior art references, other publications, and testimony, including expert testimony, to establish bases for combination of prior art references that render the charted claims obvious. Due to the related nature of the Asserted Patents, Samsung also reserves the right to rely on any cited portions of a prior art reference for one Asserted Patent against all Asserted Patents. Samsung also reserves the right to rely upon any documentary or testimonial evidence of the existence of any systems that embodied or practiced the disclosures found in the accompanying invalidity charts, for example as discussed in the prior art references cited herein, as such systems may qualify as prior art under 35 U.S.C. § 102(g).¹

Samsung intends to rely on admissions concerning the scope of the prior art relevant to the Asserted Patents found in, *inter alia*: the patent prosecution histories for the Asserted Patents and related patents and/or patent applications (including all prior art cited therein); any deposition testimony of the named inventors on the Asserted Patents and related patents and/or patent

¹ Citations herein refer to the pre-AIA version of Title 35 of the U.S. Code.

applications in this matter or any other matter; evidence and testimony relating to the level of skill in the art; and the papers filed and any evidence submitted by Headwater in connection with this matter.

Samsung reserves the right to assert that the Asserted Claims are invalid under 35 U.S.C. § 102(f) in the event Samsung obtains additional evidence that the inventors named in any of the Asserted Patents did not invent the subject matter claimed therein. Should Samsung obtain such evidence, it will provide the name of the person(s) from whom and the circumstances under which the alleged invention or any part of it was derived.

These Contentions are not intended to include or otherwise reflect Samsung's claim interpretations. Because the Court has not yet construed any of the claims in this litigation, Samsung bases these Contentions at least on its present understanding of Headwater's view and application of the claim scope, to the extent that view can be inferred from Headwater's actual and/or apparent application of those claims. But Samsung does not adopt any constructions or interpretations impliedly or expressly in these Contentions. Moreover, Samsung's Contentions may reflect alternative positions as to claim construction and scope.

For the purposes of these Contentions, Samsung has made assumptions regarding possible meanings of indefinite claim terms. By making these assumptions, Samsung does not admit that any claim language satisfies 35 U.S.C. § 112. Similarly, the use of asserted claim terms herein should not be understood to mean that such terms, as used in the Asserted Patents or claims thereof, are definite or otherwise comply with the conditions of patentability under 35 U.S.C. § 112. Likewise, the use of asserted claim terms herein should not be understood to suggest or imply a common, usual, ordinary, customary, plain, or accepted meaning in the art for any such terms.

By providing these Contentions, Samsung is not waiving nor limiting its rights to make arguments in the future about the proper scope of the claims or to advance alternative constructions to those Headwater advocates. Samsung expressly reserves the right to argue for such alternative claim constructions during this litigation and to supplement these Contentions after the Court has issued a claim construction ruling.

Samsung's factual investigations, including its investigation of prior art and grounds for invalidity, is ongoing. Further, Samsung's invalidity positions will be the subject of expert testimony. Samsung reserves the right to supplement these Contentions, including, without limitation, adding additional prior art and grounds of invalidity in accordance with the Federal Rules of Civil Procedure and Procedural Schedule in these cases, or otherwise.

II. PERSON HAVING ORDINARY SKILL IN THE ART

A person of ordinary skill in the art ("POSITA" or "POSA"), in or about 2009, would have had at least a Bachelor's degree in Electrical Engineering, Computer Science, or equivalent, and 3-5 years of experience with networking, power consumption of networked computing devices, and/or wireless digital communications systems. *See, e.g.*, '976 pat. at 12:47-13:9, 45:5-9, 93:31-42. Additional education might compensate for less experience, and vice versa.

III. IDENTIFICATION OF RELEVANT PRIOR ART

A. Priority Dates

Headwater's Infringement Contentions seemingly allege that all nine Asserted Patents can claim priority to U.S. Provisional Application Ser. No. 61/206,354, filed on Jan. 28, 2009, entitled "Services Policy Communication System and Method" ("the '354 application").² Headwater has

² While Headwater's Infringement Contentions do not specifically identify the provisional application to which the Asserted Patents allegedly claim priority, Headwater's Infringement Contentions assert that all nine Asserted Patents are entitled to a January 28, 2009 priority date—

not met its burden of establishing that the claims of the Asserted Patents are entitled to this priority date. *See In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016) (A “patentee bears the burden of establishing that its claimed invention is entitled to an earlier priority date.”).

For a patent to claim priority back to the filing date of a particular patent application, all the limitations must appear in the specification of the application to which priority is claimed. However, the ’354 application’s specification clearly fails to disclose at least the following asserted independent claim limitations, including but not limited to those limitations reciting a “foreground,” “background,” a “device state,” a “power control state,” or “Internet activity access controls to aggregate network activity,” and thus fails to disclose any claims depending therefrom:

1. **’701 patent**

- **Claim 1:** “determine, for a first end-user application capable of running in a background state and capable of running as a foreground application, whether the application is running in a background state or as a foreground application, and control, via an application program interface (API), application access for Internet service activities provided through the WWAN modem and the WLAN modem, to, based on a first differential traffic control policy, selectively block and allow access by the first end-user application to the WWAN modem at a time when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN”;
- **Claim 1:** “wherein the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application.”

2. **’184 patent**

- **Claim 1:** “classify whether a particular application associated with an Internet service access request, and capable of both interacting with a user in a user interface foreground of the device, and at least some Internet service activities when not interacting with a user in the device user interface foreground”;

the date on which the ’354 application was filed. *See* Headwater’s P.R. 3-1(e) disclosures. To the extent that Headwater later asserts it is relying on a different application for priority, Samsung expressly reserves the right to modify these Contentions accordingly.

- **Claim 1:** “is interacting with the user in the device user interface foreground”; and
- **Claim 1:** “apply a differential traffic control policy to the Internet service access request, based on (i) whether the application is classified as interacting with the user, and (ii) a differential traffic control policy list distinguishing between a first one or more applications resident on the device and a second one or more applications resident on the device, such that, the one or more processors are operable to, in a first state wherein the particular application is one of the first one or more applications, and the particular application is not classified as interacting with a user in the device user interface foreground, block the Internet service access request.”

3. '578 patent

- Claim 1: “a user interface to allow a user to set one or more of a plurality of aspects of the differential traffic control policy to select one or more applications that are only allowed to utilize the at least one WWAN for Internet service activities when those applications are classified as interacting with a user in the device user interface foreground”;
- Claim 1: “one or more processors configured to implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application, including whether the user-settable aspects of the policy only allow the particular application to utilize the at least one WWAN for Internet service activities when the particular application is classified as interacting with a user in the device user interface foreground.”

4. '445 patent

- **Claim 1:** “classify, as a second classification, whether a particular application associated with an Internet service access request, and capable of both interacting with a user in a user interface foreground of the device”;
- **Claim 1:** “at least some Internet service activities when not interacting with a user in the device user interface foreground, is interacting with the user in the device user interface foreground”; and
- **Claim 1:** “block the Internet service access request in a first state of the first and second classifications, wherein data for Internet service activities is classified as to be provided through the WWAN modem, and the particular application is not classified as interacting with a user in the device user interface foreground.”

5. '224 patent

- **Claim 1:** “classify, as a first classification for each given one of the network service usage activities, a classification based on the application associated with the given network service usage activity and that allows for a differential network access control, wherein the differential network access control comprises a set of service usage control policies applicable when a network service is available via the at least one wireless modem,

including at least a first policy that allows the given network service usage activity to currently communicate data with a network destination via the at least one wireless modem, and a second policy that defers data communication associated with the given network service usage activity until a device state change occurs”;

- **Claim 1:** “associate each given one of the network service usage activities with a service usage control policy dynamically selected from the set of service usage control policies, based on the first classification of the given network service usage activity and at least one device state.”

6. '976 patent

- **Claim 1:** “one or more processors configured to classify, for a first end-user application capable of interacting in the device display foreground with a user and capable of at least some Internet service activity when not interacting in the device display foreground with the user, whether or not the first end-user application, when running, is interacting in the device display foreground with the user”;
- **Claim 1:** “for a time period when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN, apply a first differential traffic control policy to Internet service activity on behalf of the first end-user application, such that Internet service activity on behalf of the first end-user application is disallowed when the one or more processors classify the first end-user application as not interacting in the device display foreground with the user”;
- **Claim 1:** “a first network access condition that indicates the unavailability to the first end-user application, when the first end-user application is classified as not interacting in the device display foreground with the user, of Internet data service that is available via the WWAN modem”; and
- **Claim 1:** “a second network access condition that indicates the availability to the first end-user application, when the first end-user application is classified as interacting in the device display foreground with the user, of Internet data service that is available via the WWAN modem.”

7. '433 patent

- **Claim 1:** “when the one or more Internet activity access controls are to be applied, apply the one or more Internet activity access controls to aggregate network activity for the first Internet access request with network activity for one or more other data communication requests, which are otherwise not associated with the first end-user application, before allowing network activity in association with the first Internet access request.”

8. '544 patent

- **Claim 1:** “a processor that executes instructions to associate network service usage activity, on behalf of a first device application, and that occurs when the first device

application is not in the foreground of user interaction, with a network service usage control policy”;

- **Claim 1:** “set an application state indicating whether the first device application, associated with a particular network service usage activity, is in the foreground of user interaction”; and
- **Claim 1:** “dynamically determine whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state.”

9. '773 patent

- **Claim 1:** “receive respective requests from a plurality of applications on the device to access the WWAN for background network service usage activities associated with the respective applications”;
- **Claim 1:** “based at least in part on a current WWAN network busy state, select a corresponding current service usage control policy for the background network service usage activities”;
- **Claim 1:** “determine respective deferred time slots for each of the background network service usage activities based on the current service usage control policy, wherein at least one such service usage control policy specifies that during a time when the current WWAN network busy state indicates network congestion, a selected subset of the background network service usage activities are deferred until network congestion is no longer indicated”; and
- **Claim 1:** “allow each of the background network service usage activities to access the WWAN during the respective deferred time slot for that background network service usage activity.”

Thus, the Asserted Claims' cannot claim priority to January 28, 2009. Nevertheless, even under Headwater's incorrect priority date, the Asserted Patents are invalid.

To the extent it is later argued by Headwater, or otherwise determined that a different priority date applies, Samsung reserves the right to amend these Contentions accordingly.

B. Prior Art Patent Publications

Based on their investigation to date, Samsung has provided in the list below the prior art patent publications presently known to Samsung that it contends anticipate and/or render obvious the Asserted Claims. The prior art identified in these Contentions discloses (i.e., anticipates and/or

renders obvious) the elements of the Asserted Claims either explicitly or inherently. Similarly, the prior art patent publications listed on the face of the Asserted Patents discloses (i.e., anticipates and/or renders obvious) the elements of the Asserted Claims either explicitly or inherently, and Samsung reserves the right to rely on any such reference.

Prior-art patents or publications included in these Contentions may be related (such as a divisional, continuation, continuation-in-part, parent, or child) to earlier or later-filed patents or publications, may have counterparts filed in other jurisdictions, or may incorporate (or be incorporated by) other patents or publications by reference. The listed patents or publications are intended to be representative of these other patents or publications to the extent they exist. Samsung accordingly reserves the right to modify, amend, or supplement these Contentions with these related patents or publications, as well as other prior art references, upon further investigation. Additionally, any reference in these Contentions, including the appendices and exhibits thereto, to a specific subsection or subsections of 35 U.S.C. § 102, is merely exemplary, and Samsung expressly reserves the right to rely on additional or other sections of 35 U.S.C. § 102, as appropriate. If Headwater asserts that one or more of these references or systems fails to disclose one or more elements of a claim, Samsung reserves the right to also use those references to invalidate the claim under 35 U.S.C. § 103.

Discovery is ongoing, and Samsung's prior art investigation and third-party discovery is therefore not yet complete. Samsung reserves the right to present additional items of prior art under 35 U.S.C. §§ 102 and/or 103 that are located during the course of discovery or further investigation. For example, Samsung expects to receive documents from additional third parties either through informal requests or under subpoenas that are believed to have knowledge, documentation, and/or corroborating evidence concerning some of the prior art listed and

discussed below. These third parties include without limitation the authors, inventors, or assignees of the references listed in these disclosures.

Patent Publication	Publication/Issue Date
U.S. Patent No. 7,260,635 B2	Aug. 21, 2007
U.S Patent Application Pub. No. 2002/0166117 A1	Nov. 7, 2002
U.S Patent Application Pub. No. 2006/0039354 A1	Feb. 23, 2006
U.S Patent Application Pub. No. 2006/0059556 A1	Mar. 16, 2006
U.S Patent Application Pub. No. 2010/0017506 A1	Jan. 21, 2010
U.S Patent Application Pub. No. 2011/0019557 A1	Jan. 27, 2011
U.S. Patent No. 7,069,330 B1	Jun. 27, 2006
U.S. Patent No. 8,397,087 B1	Mar. 12, 2013
U.S. Patent No. 8,667,513 B1	Mar. 4, 2014
U.S Patent Application Pub. No. 2005/0026654 A1	Feb. 3, 2005
U.S. Patent No. 5,987,611	Nov. 16, 1999
U.S Patent Application Pub. No. 2012/0102504 A1	Apr. 26, 2012
U.S. Patent No. 9,098,333 B1	Aug. 4, 2015
U.S Patent Application Pub. No. 2012/0265897 A	Oct. 18, 2012
U.S Patent Application Pub. No. 2009/0190471 A1	Jul. 30, 2009
U.S. Patent No. 8,320,272 B2	Nov. 27, 2012

U.S. Patent No. 8,437,748 B2	May 7, 2013
U.S Patent Application Pub. No. 2008/0085717 A1	Apr. 10, 2008
U.S Patent Application Pub. No. 2010/0112955 A1	May 6, 2010
European Patent Application EP 1 484 871 A1	Dec. 8 2004
KR 2009/0036186 A	Apr. 14, 2009
U.S. Patent No. 9,398,103 B2	Jul. 19, 2016
U.S. Patent Application Pub. No. 2002/0133598 A1	Sep. 19, 2002
U.S. Patent Application Pub. No. 2008/0282080 A1	Nov. 13, 2008
International Publication No WO 2008/043278 A1	Apr. 17, 2008
U.S. Patent No. 9,008,673 B1	Apr. 14, 2015
U.S. Patent Application Pub. No. 2009/0028127 A1	Jan. 29, 2009
U.S. Patent No. 6,898,654 B1	May 24, 2005
U.S. Patent Application Pub. No. 2006/0053113 A1	Mar. 9, 2006
International Publication No. WO 2005/015379 A1	Feb. 2, 2008
U.S. Patent No. 8,099,078 B2	Jan. 17, 2012
U.S. Patent Application Pub. No. 2006/0229090 A1	Oct. 12, 2006
Australian Application Pub. No. 2003255114 B2	Aug. 13, 2003

U.S. Patent Application Pub. No. 2007/0038763 A1	Feb. 15, 2007
U.S. Patent Application Pub. No. 2009/0207817 A1	Aug. 20, 2009
U.S. Patent No. 6,578,077 B1	Jun. 10, 2003
U.S. Patent Application Pub. No. 2008/0080457 A1	Apr. 3, 2008
U.S. Patent Application Pub. No. 2008/0084977 A1	Apr. 10, 2008
U.S. Patent Application Pub. No. 2005/0108075 A1	May 19, 2005
U.S. Patent No. 7,290,034 B2	Oct. 30, 2007
U.S. Patent No. 8,028,060 B1	Sep. 27, 2011
U.S. Patent No. 8,260,253 B2	Sep. 4, 2012
U.S. Patent No. 9,516,129 B2	Dec. 6, 2016
U.S. Patent Application Pub. No. 2007/0162582 A1	Jul. 12, 2007
U.S. Patent Application Pub. No. 2008/0080458 A1	Apr. 3, 2008
U.S. Patent Application Pub. No. 2009/0217065 A1	Aug. 27, 2009
U.S. Patent Application Pub. No. 2009/0307696 A1	Dec. 10, 2009
U.S. Patent Application Pub. No. 2010/0077035 A1	Mar. 25, 2010
U.S. Patent Application Pub. No. 2010/0115048 A1	May 6, 2010
U.S. Patent Application Pub. No. 2011/0185202 A1	Jul. 28, 2011

U.S. Patent Application Pub. No. 2012/0023236 A1	Jan. 26, 2012
U.S. Patent Application Pub. No. 2012/0185577 A1	Jul. 19, 2012
U.S. Patent Application Pub. No. 2012/0260118 A1	Oct. 11, 2012
U.S. Patent Application Pub. No. 2012/0284620 A1	Nov. 8, 2012
U.S. Patent Application Pub. No. 2011/0249668 A1	Oct. 13, 2011
U.S. Patent Application Pub. No. 2011/0312283 A1	Dec. 22, 2011
U.S. Patent Application Pub. No. 2012/0157038 A1	Jun. 21, 2012
U.S. Patent No. 7,821,985 B2	Oct. 26, 2010
U.S. Patent Application Pub. No. 2009/0119773 A1	May 7, 2009
U.S. Patent No. 7,751,330 B2	Jul. 6, 2010
U.S. Patent Application Pub. No. 2011/0019574 A1	Jan. 27, 2011
U.S. Patent No. 8,135,443 B2	Mar. 13, 2012
U.S. Patent Application Pub. No. 2011/0314151 A1	Dec. 22, 2011
U.S. Patent No. 8,626,115 B2	Jan. 7, 2014
U.S. Patent No. 8,589,541 B2	Nov. 19, 2013
U.S. Patent No. 8,429,409 B1	Apr. 23, 2013
U.S. Patent No. 6,185,576 B2	Feb. 6, 2001
U.S. Patent No. 8,666,364 B2	Mar. 4, 2014

U.S. Patent No. 8,634,821 B2	Jan. 21, 2014
U.S. Patent Application Pub. No. 2013/0117382 A1	May 9, 2013
U.S. Patent Application Pub. No. 2013/0103376 A1	Apr. 25, 2013
U.S. Patent Application Pub. No. 2013/0149994 A1	Jun. 13, 2013
U.S. Patent Application Pub. No. 2013/0111572 A1	May 2, 2013
U.S. Patent Application Pub. No. 2012/0101952 A1	Apr. 26, 2012
U.S. Patent Application Pub. No. 2013/0183937 A1	Jul. 18, 2013
U.S. Patent Application Pub. No. 2015/0207760 A1	Jul. 23, 2015
International Publication No. WO 2012/047275A1	Apr. 12, 2012
JP 2010/261635 A	Nov. 18, 2010

C. Prior Art Non-Patent Publications^{3,4}

Non-Patent Publication	Publication Date
Wireless Wakeups Revisited: Energy Management for VoIP over Wi-Fi Smartphones	June 2007
How Can I Run an Application at a Higher Priority?	Mar. 19, 2000
Wake on Wireless: An Event Driven Energy Saving Strategy for Battery Operated Devices	Sep. 2002
Power Management in Mobile and Pervasive Computing Systems	November 2005
BlackBerry Pearl 9105 Smartphone	2010
Nokia N95 8GB User Guide	2007
Power Management Techniques for Mobile Communication	1998
Internet Traffic Manager	Aug. 11, 2009
Nexus One User's Guide	Mar. 15, 2010
iPhone User Guide For iPhone OS 3.1 Software	2009
Nokia E90 Communicator User Guide	2007
Nokia N97 User Guide	2009

³ Any discussion of a non-patent publication in either Section III.C or in one of the claim charts included herewith that discloses a corresponding product or system shall also apply with equal force to the underlying product or system. In other words, both the non-patent publication and the underlying product or system themselves qualify as prior art in the context that they are used herein.

⁴ Discovery is currently ongoing, and Samsung will supplement these Contentions with respect to the public availability, as necessary, of any non-patent publication if and when more information becomes available. Indeed, Samsung expects to receive documents from third parties either through informal requests or under subpoenas that are believed to have knowledge, documentation, and/or corroborating evidence concerning the public availability of the identified non-patent publications.

Developing Software for Symbian OS	2006
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Moreover, the prior art non-patent publications listed on the face of the Asserted Patents discloses (i.e., anticipates and/or renders obvious) the elements of the Asserted Claims either explicitly or inherently, and Samsung reserves the right to rely on any such reference.

D. Prior Art Systems and/or Knowledge

The Asserted Claims are invalid under 35 U.S.C. §§ 102 and/or 103 based on prior art items offered for sale or publicly used or known or prior inventions, such as prior art products, including systems embodying any alleged inventions or structures described in, and/or any knowledge disclosed by or referred to in, any of the prior art patents or prior art publications identified above in Sections III.B and III.C. Because Samsung has not yet completed discovery in this case, Samsung reserves the right to supplement these Contentions with facts, documents, or other information learned at a later point through third-party discovery or further investigation. For example, Samsung expects to receive documents from additional third parties either through informal requests or under subpoenas that are believed to have knowledge, documentation, and/or corroborating evidence concerning some of the prior art listed above and below and/or additional prior art. These third parties include without limitation the authors, inventors, or assignees of the references listed in these Contentions. In addition, Samsung reserves the right to assert invalidity under other sections of 35 U.S.C. § 102 to the extent that discovery or further investigation yield information forming the basis for such invalidity.

Moreover, all of the systems and products listed below qualify as prior art to each of the Asserted Patents under at least pre-AIA 35 U.S.C. §§ 102(a)/(b). Such systems and products were known, used, offered for sale, and/or sold in the United States prior to the appropriate priority date corresponding to each of the Asserted Patents.

Devices
Android Devices (e.g., HTC Dream/T-Mobile G1, Samsung GT-I7500 Galaxy, Nexus One, and emulators) ⁵
Apple Devices (including iPhone, iPhone 3G, iPhone 3GS, and emulators)
Symbian Devices (including Nokia E90, N95, N97, E72, and emulators)
Windows Mobile Devices (including devices with Windows Mobile installed and emulators)
Windows XP Devices (including devices with Windows XP installed and emulators)

Operating Systems
Android including Android 1.0 (released September 2008), Android 1.1 (released February 2009), Android Cupcake (1.5) (released April 2009), Android Donut (1.6) (released September 2009), Android Eclair (2.0, 2.0.1, 2.1) (released October 2009 - January 2010), Android Froyo (2.2) (released May 20, 2010) ⁶
iPhone OS including iPhone OS 1.0 (released June 29, 2007), iPhone OS 2.0 (released July 11, 2008), iPhone OS 3.0 (released June 19, 2009)
Symbian OS including Symbian OS 9.1 (released 2005), Symbian OS 9.2, 9.3 (released 2006), Symbian OS 9.4 (released 2007), and associated platforms including S60 3rd Edition (released 2001/2002), S60 3rd Edition, Feature Pack 1 and Feature Pack 2, and S60 5th Edition (released October 2008)
Windows Mobile including Windows Mobile 6.1 (released April 1, 2008) and Windows Mobile 6.5 (released May 11, 2009)
Windows XP including its various editions such as Home Edition and Tablet PC Edition (Windows XP was initially released October 2001)

Applications
JuiceDefender (including JuiceDefender and associated add-on application, UltimateJuice)
GreenPower

⁵ See, e.g., SAMSUNG_PRIORART0000001-334; SAMSUNG_PRIORART0005174-76; SAMSUNG_PRIORART0005177-317; SAMSUNG_PRIORART0005416-19; SAMSUNG_PRIORART0005420-23; SAMSUNG_PRIORART0005424-28; SAMSUNG_PRIORART0005429-44; SAMSUNG_PRIORART0005445-48; SAMSUNG_PRIORART0005449-52; SAMSUNG_PRIORART0005453-57; SAMSUNG_PRIORART0005458-71; SAMSUNG_PRIORART0005472-77; SAMSUNG_PRIORART0005478-84; SAMSUNG_PRIORART0005485-86; SAMSUNG_PRIORART0005488-5624; Section IV.B.2, *infra*.

⁶ E.g., GOOG-HEADWATER-000000001-123; SAMSUNG_PRIORART0005042-5487; Section IV.B.2, *infra*. For Android versions 1.0-2.2, code from earlier versions carried over into later versions. Thus, any code cited from an earlier version of Android also exists in the later version.

Microsoft Applications (including Microsoft Outlook Mobile, Windows Live, and MyPhone)
Apple Applications (including Mail, Calendar, MobileMe, Backup, and Newsstand API)
Citrix Applications (including XenApp, XenDesktop, NetScaler, Citrix Receiver, Citrix Cloud Bridge)

The Federal Circuit has held that “[t]he proper test for the public use prong of the [pre-AIA] § 102(b) statutory bar is whether the purported use: (1) was accessible to the public; or (2) was commercially exploited.” *See Invitrogen Corp. v. Biocrest Mfg. L.P.*, 424 F.3d 1374, 1380 (Fed. Cir. 2005). Additionally, the on-sale bar of § 102(b) is triggered when the invention is both (1) the subject of a commercial offer for sale not primarily for experimental purposes and (2) ready for patenting. *Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 67 (1998). Each of the systems and products listed above meets these criteria.

The above discussion is not exclusive. Samsung reserves the right to rely on both the listed products as well as other products that may become known and/or relevant during the course of this matter. Samsung also reserves the right to rely on forthcoming testimony and/or declarations from third-party witnesses, including but not limited to witnesses from Google, Apple, Microsoft, Nokia, HMD, and Citrix relating to the above products, applications, and operating systems.

Any citation to one or more of these prior art references, or other prior art references regarding any method or system, should be construed to constitute not only a citation to the prior art reference itself but also a reference to the system itself. Discovery is ongoing in this case, and Samsung will supplement these Contentions if and when more information becomes available. For example, Defendants are already in the process of taking discovery from non-parties including Nokia, HMD, Citrix, Google, Apple, and Microsoft. Accordingly, Defendants reserve the right to modify, amend, and/or supplement these contentions as information becomes available from non-parties.

E. Prior Art Under 35 U.S.C. §§ 102(f) and 102(g)

Each prior art patent, publication, or product identified above was either effectively filed or issued (for patents), published (for publications) or known, used, offered for sale or sold (for products) before either the earliest claimed priority date of the Asserted Patents to which it is applied for invalidity, and none appears to have been abandoned, suppressed, or concealed, so each such reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g), if it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products.

Because Samsung has not yet completed discovery in this case, including taking depositions of the named inventors of the Asserted Patents, reviewing Headwater's productions, and seeking discovery of prior inventions by third parties, Samsung reserves the right to supplement these Contentions with facts, documents, or other information learned at a later point through discovery or further investigation.

IV. ANTICIPATION AND OBVIOUSNESS (35 U.S.C. §§ 102 AND 103)

The Asserted Claims are anticipated by and/or rendered obvious in view of one or more items of prior art identified in these Contentions, alone and/or in combination. Based on its investigation to date, Samsung has provided in the lists above the prior art presently known to Samsung that anticipates and/or renders obvious the Asserted Claims under at least Headwater's actual and/or apparent application of those claims. The prior art identified in these Contentions discloses (i.e., anticipates and/or renders obvious) the elements of the Asserted Claims either explicitly or inherently.

Prior art patents or publications included in these Contentions may be related (such as a divisional, continuation, continuation-in-part, parent, or child) to earlier or later-filed patents or

publications, may have counterparts filed in other jurisdictions, or may incorporate (or be incorporated by) other patents or publications by reference. The listed patents or publications are intended to be representative of these other patents or publications to the extent they exist. Samsung accordingly reserves the right to modify, amend, or supplement these Contentions with these related patents or publications, as well as other prior art references, upon further investigation. Additionally, any reference in these Contentions, including the appendices and/or exhibits thereto, to a specific subsection or subsections of 35 U.S.C. § 102, is merely exemplary, and Samsung expressly reserves the right to rely on additional or other sections of 35 U.S.C. § 102, as appropriate.

Although Samsung's investigation is ongoing, information available to date indicates that each prior art system disclosed above was at least (1) known or used in this country before the alleged invention of the claimed subject matter of the Asserted Patents; (2) in public use, on sale, or offered for sale in this country more than one year before the effective filing date for the Asserted Patents; or (3) invented and not abandoned, suppressed, or concealed prior to the alleged invention of the Asserted Patents.

Much of the art identified in these Contentions reflects common knowledge and the state of the art prior to the filing or asserted priority dates of the Asserted Patents. As such, the obviousness combinations in these Contentions are intended to be exemplary. There are many possible combinations of the disclosed prior art, and the inclusion of certain exemplary combinations does not exclude other combinations. For example, where a particular contention calls for combining references, any of a number of references can be combined.

Depending on the construction of the claims of the Asserted Patents, and/or positions that Headwater or its expert witnesses may take concerning claim interpretation, infringement, and/or

invalidity issues, different ones of the charted prior art references in the Exhibits may be of greater or lesser relevance and different combinations of these references may be implicated. Given the uncertainty, the charts may reflect alternative applications of the prior art against the Asserted Claims.

Citations to particular excerpts from the prior art are likewise exemplary and not exhaustive of the evidentiary support for the invalidity of the Asserted Patents contained in and/or concerning a particular piece of prior art. Samsung may rely on uncited portions of the prior art references, other documents or operational systems, the “Background of the Invention” and other relevant portions of the Asserted Patents, the prosecution histories of the Asserted Patents (including all cited references) and their related patents and applications, and forthcoming fact and expert testimony to provide context to aid in understanding the prior art reference and/or the cited portions of the references. Where Samsung cites to a particular figure in a reference, the citation encompasses the caption and description of the figure and any text relating to or discussing the figure. Likewise, where Samsung cites text referring to a figure, the citation includes the figure as well (and vice versa).

A. Prior Art Under 35 U.S.C. § 102

Samsung contends that at least the primary prior art references (Exs. -01 through -09) and systems (Exs. -10 through -11) identified below, by themselves, anticipate the Asserted Claims:

Exhibits	Primary References and/or Systems
A-01, B-01, C-01, D-01, E-01, F-01, G-01, H-01, I-01	U.S. Patent Publication No. 2008/0080458A1 to Cole (“Cole”)
A-02, B-02, C-02, D-02, E-02, F-02, G-02, H-02, I-02	U.S. Patent Publication No. 2007/0038763A1 to Oestvall (“Oestvall”)

Exhibits	Primary References and/or Systems
A-03, B-03, C-03, D-03, E-03, F-03, G-03, H-03, I-03	U.S. Patent Publication No. 2006/0039354A1 to Rao et al. (“Rao”)
A-04, B-04, C-04, D-04, E-04, F-04, G-04, H-04, I-04	European Patent No. 1,484,871 A1 to Kelz (“Kelz”)
A-05, B-05, C-05, D-05, E-05, F-05, G-05, H-05, I-05	U.S. Patent Publication No. 2010/0115048A1 to Scahill (“Scahill”)
A-06, B-06, C-06, D-06, E-06, F-06, G-06, H-06, I-06	U.S. Patent No. 8,028,060 B1 to Wyld et al. (“Wyld”)
A-07, B-07, C-07, D-07, E-07, F-07, G-07, H-07, I-07	U.S. Patent Publication No. 2009/0217065A1 to Araujo, JR. (“Araujo”)
A-08, B-08, C-08, D-08, E-08, F-08, G-08, H-08, I-08	U.S. Patent No. 5,987,611 to Freund (“Freund”)
A-09, B-09, C-09, D-09, E-09, F-09, G-09, H-09, I-09	U.S. Patent No. 6,898,654 B1 to Senior et al. (“Senior”)
A-10, B-10, C-10, D-10, E-10, F-10, G-10, H-10, I-10	Android Devices
A-11, B-11, C-11, D-11, E-11, F-11, G-11, H-11, I-11	Mobile Devices: Symbian Devices, Apple Devices, Microsoft Mobile Devices, Microsoft XP Devices

Specifically, Samsung contends that at least the references and/or systems in the table above independently anticipate the Asserted Claims under 35 U.S.C. §§ 102(a), (b), (e), (f) and/or (g), as set forth in the charts attached as:

- Exhibits A-01 through Exhibits A-11 for the asserted claims of the ’701 patent;

- Exhibits B-01 through Exhibits B-11 for the asserted claims of the '184 patent;
- Exhibits C-01 through Exhibits C-11 for the asserted claims of the '578 patent;
- Exhibits D-01 through Exhibits D-11 for the asserted claims of the '445 patent;
- Exhibits E-01 through Exhibits E-11 for the asserted claims of the '224 patent;
- Exhibits F-01 through Exhibits F-11 for the asserted claims of the '976 patent;
- Exhibits G-01 through Exhibits G-11 for the asserted claims of the '433 patent;
- Exhibits H-01 through Exhibits H-11 for the asserted claims of the '544 patent; and
- Exhibits I-01 through Exhibits I-11 for the asserted claims of the '773 patent.

Where an asserted prior art reference in any attached claim charts relies on a claim of priority to assert a critical reference date under pre-AIA 35 U.S.C. § 102 *et seq.* (including pre-AIA § 102(e)), compliance with pre-AIA 35 U.S.C. § 112, first paragraph, or 35 U.S.C. § 112(a), is shown in an appendix to a given claim.

These charts, however, are exemplary. The claimed features are similarly described and suggested in other places (including in all of the documents cited during prosecution of each piece of prior art), and also were present when prior-art systems practicing the described prior art were used before the application that ultimately led to the Asserted Patents. Thus, where patents or other printed materials are disclosed, Samsung reserves the right to also rely on those materials as descriptions of systems, devices, or methods referenced therein, publicly used, and/or on sale or known in the United States. Further, Samsung reserves the right to rely on other evidence of the prior art beyond merely the exemplary references cited in the charts attached as Exhibits.

Where patents or other printed materials are disclosed, Samsung reserves the right to also rely on those materials as descriptions of systems, devices, or methods referenced therein, publicly used, and/or on sale or known in the United States. Samsung reserves the right to also use those references to invalidate the claim under 35 U.S.C. § 103.

B. Prior Art Under 35 U.S.C. § 103

To the extent that a primary reference is deemed, by itself, not to anticipate or render obvious a claim for failing to teach one or more limitations, the claim would nonetheless have been obvious to a POSITA at the time of the invention by the combination of the primary reference with one or more other primary references and/or the knowledge of someone skilled in the art.

Moreover, Exhibits A-A, B-B, C-C, D-D, E-E, F-F, G-G, H-H, and I-I list secondary prior art references and identify, on limitation-by-limitation bases, exemplary disclosures where each secondary reference teaches the limitations of the asserted claims. To the extent that a primary reference is deemed, by itself, not to anticipate or render obvious a claim for failing to teach one or more limitations, the claim would nonetheless have also been obvious to a POSITA at the time of the invention by the additional combination of the primary reference with one or more of the references listed as disclosing those alleged missing limitations in Exhibits A-A, B-B, C-C, D-D, E-E, F-F, G-G, H-H, and I-I.

As such, a POSITA would have been motivated to combine any reference set forth in at least the following charts:

- Exhibit A-01 through Exhibit A-11 and Exhibit A-A for the asserted claims of the '701 patent;
- Exhibit B-01 through Exhibit B-11 and Exhibit B-B for the asserted claims of the '184 patent;
- Exhibit C-01 through Exhibit C-11 and Exhibit C-C for the asserted claims of the '578 patent;
- Exhibit D-01 through Exhibit D-11 and Exhibit D-D for the asserted claims of the '445 patent;
- Exhibit E-01 through Exhibit E-11 and Exhibit E-E for the asserted claims of the '224 patent;
- Exhibit F-01 through Exhibit F-11 and Exhibit F-F for the asserted claims of the '976 patent;

- Exhibit G-01 through Exhibit G-11 and Exhibit G-G for the asserted claims of the '433 patent;
- Exhibit H-01 through Exhibit H-11 and Exhibit H-H for the asserted claims of the '544 patent; and
- Exhibit I-01 through Exhibit I-11 and Exhibit I-I for the asserted claims of the '773 patent.

Such combinations would be achieved, for example, by merely combining the disclosures described in the respective claim charts for each reference.

These charts, however, are exemplary. The claimed features are similarly described and suggested in other places (including in all of the documents cited during prosecution of each piece of prior art), and also were present when prior-art systems practicing the described prior art were used before the application that ultimately led to the Asserted Patents. For example, like the Asserted Patents, U.S. Patent No. 8,666,364 B2 includes the concept of reducing data usage over multiple networks (WLAN, WWAN). Similarly, like the Asserted Patents, U.S. Patent Pub. No. 2012/0101952A1 includes the concept of services level per application. *See* 2012/0101952A1 at [0084] (“Additional embodiments may be provided to manage the level of services delivered to networked devices and to manage such services on a service-by-service basis. For example, various embodiments can be configured to provide cost effective services or service classes that match growing digital networking usage patterns. As a further example, in some embodiments, systems and methods are provided that allow access providers to not only control and bill for basic access, but to control and bill for higher level service delivery on a service-by-service basis. Such service-by-service control and billing can be provided based on service types or on service classes or on a combination thereof. Example services may include rich Internet access and email, application based billing, content distribution, entertainment activities, information or content subscription or gaming.”). Thus, where patents or other printed materials are disclosed, Samsung reserves the right to also rely on those materials as descriptions of systems, devices, or methods

referenced therein, publicly used, and/or on sale or known in the United States. Further, Samsung reserves the right to rely on other evidence of the prior art beyond merely the exemplary references cited in the charts attached as Exhibits.

Samsung's assertion that the combinations above render the asserted claims obvious under 35 U.S.C. § 103 is not, and is not intended to be, an admission or suggestion that each reference does not independently anticipate the Asserted Claims under 35 U.S.C. § 102. *See Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983) (“[A]nticipation is the epitome of obviousness.”) (quoting *In re Fracalossi*, 681 F.2d 792, 794 (CCPA 1982)). Further, the fact that certain secondary references are listed solely in Exhibits A-A, B-B, C-C, D-D, E-E, F-F, G-G, H-H, and I-I is not intended to be an admission or suggestion that each individual reference cited therein does not also independently anticipate and/or render obvious the Asserted Claims under 35 U.S.C. §§ 102 and 103. Samsung expressly reserves the right to rely on any secondary reference cited in Exhibits A-A, B-B, C-C, D-D, E-E, F-F, G-G, H-H, and I-I as if it were set forth as a primary reference in Section IV.A, *supra*. Finally, the inclusion of the exemplary combinations in the attached Exhibits and Appendices does not exclude other combinations of prior art disclosed in this or previous sections.

1. Exemplary Combinations

Exemplary combinations of prior art references that render the Asserted Claims invalid as obvious under 35 U.S.C. § 103 are described in:

- Exhibit A-01 through Exhibit A-11 and Exhibit A-A for the asserted claims of the '701 patent;
- Exhibit B-01 through Exhibit B-11 and Exhibit B-B for the asserted claims of the '184 patent;
- Exhibit C-01 through Exhibit C-11 and Exhibit C-C for the asserted claims of the '578 patent;

- Exhibit D-01 through Exhibit D-11 and Exhibit D-D for the asserted claims of the '445 patent;
- Exhibit E-01 through Exhibit E-11 and Exhibit E-E for the asserted claims of the '224 patent;
- Exhibit F-01 through Exhibit F-11 and Exhibit F-F for the asserted claims of the '976 patent;
- Exhibit G-01 through Exhibit G-11 and Exhibit G-G for the asserted claims of the '433 patent;
- Exhibit H-01 through Exhibit H-11 and Exhibit H-H for the asserted claims of the '544 patent; and
- Exhibit I-01 through Exhibit I-11 and Exhibit I-I for the asserted claims of the '773 patent.

Moreover, each prior art reference or system may be combined with (1) information known to persons skilled in the art at the time of the alleged invention; (2) any other anticipatory prior art references or systems; and (3) any of the additional prior art identified above or in the prosecution of the Asserted Patents and related applications.

Below are examples of prior art references and/or systems that would have been combined by one of ordinary skill in the art at the time of the alleged invention. These combinations are merely examples. The Asserted Claims are rendered obvious by:

- Cole alone or in combination with one or more of Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Oestvall alone or in combination with one or more of Cole, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Rao alone or in combination with one or more of Cole, Oestvall, Montemurro, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Kelz alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;

- Scahill alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Wyld alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Araujo alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Freund alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Senior alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Freund;
- Android Devices (including operating systems and applications running therein) with one or more applications alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Apple Devices (including operating systems and applications running therein) with one or more applications alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Symbian Devices (including operating systems and applications running therein) alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Windows Mobile Devices (including operating systems and applications running therein) alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior;
- Windows XP Devices (including operating systems and applications running therein) alone or in combination with one or more of Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Aleksic, and Senior; and

- Any combination of one or more of Android Devices, Apple Devices, Symbian Devices, Windows Mobile Devices, and Windows XP Devices, including the operating systems and applications running therein.

2. Exemplary Motivations to Combine

To the extent a finder of fact finds that any primary prior art reference does not disclose one or more limitations of an asserted claim, the asserted claim is nevertheless obvious because the allegedly missing limitations contain nothing beyond ordinary improvements. In other words, the asserted claim combines known elements to achieve predictable results or chooses between clear alternatives known to those of skill in the art, particularly in view of the state of the art as reflected in the relevant prior art.

Moreover, as explained above, it would have been obvious to a person of skill in the art at the time of the alleged invention of the asserted claims to combine any primary reference with any combination of other primary references or secondary references so as to practice the asserted claims. To the extent that Headwater argues that any concept claimed in the asserted claims is not disclosed in a primary reference, it would, at a minimum, have been obvious to adapt the primary reference to include the concept or combine it with other primary references or secondary references that disclose the concept. Each concept described and claimed in the Asserted Patents was known to those of skill in the art as available design choices for various network data saving features, battery saving features, and network connectivity management functions.

The Supreme Court has held that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). “When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one.” *Id.* at 417. As the Supreme Court made clear, “[f]or the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would

recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *Id.*

To determine whether there is an apparent reason to combine the known elements in the fashion claimed by the patent at issue, a court can “look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art.” *Id.* at 418. For example, obviousness can be demonstrated by showing “there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent’s claims.” *Id.* at 420. “[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.” *Id.* Common sense also teaches that “familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.*

However, the Supreme Court in *KSR* held that a claimed invention can be obvious even if there is no explicit teaching, suggestion, or motivation for combining the prior art to produce that invention. In summary, *KSR* holds that patents that are based on new combinations of elements or components already known in a technical field may be found to be obvious. *See, generally, KSR*, 127 S.Ct. 1727. Specifically, the Court in *KSR* rejected a rigid application of the “teaching, suggestion, or motivation [to combine]” test. *Id.* at 1741. “In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim.” *Id.* at 1741-1742. “Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner

claimed.” *Id.* at 1742. A key inquiry is whether the “improvement is more than the predictable use of prior art elements according to their established functions.” *Id.* at 1740.

The rationale to combine or modify prior art references is significantly stronger when, as here, the references seek to solve the same problem, come from the same field, and correspond well to each other. *In re Inland Steel Co.*, 265 F.3d 1354, 1362 (Fed. Cir. 2001). The Federal Circuit has held that two references may be combined as invalidating art under similar circumstances, namely “[the prior art] focus[es] on the same problem that the . . . patent addresses: enhancing the magnetic properties of . . . steel. Moreover, both [prior art references] come from the same field Finally, the solutions to the identified problems found in the two references correspond well.” *Id.* at 1364 (concerning patents and prior art relating to improving the magnetic and electrical properties of steel).

In view of the Supreme Court’s *KSR* decision, the PTO issued a set of Examination Guidelines. Examination Guidelines for Determining Obviousness Under 35 U.S.C. §103 in view of the Supreme Court Decision in *KSR International Co. v. Teleflex, Inc.*, 72 Fed. Reg. 57526 (October 10, 2007). Those Guidelines summarized the *KSR* decision and identified various rationales for finding a claim obvious, including those based on other precedents. Those rationales include:

- (A) Combining prior art elements according to known methods to yield predictable results;
- (B) Simple substitution of one known element for another to obtain predictable results;
- (C) Use of known technique to improve similar devices (methods, or products) in the same way;
- (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- (E) “Obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art;

(G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Id. at 57529. The above rationales likewise apply in rendering obvious the asserted claims of the Asserted Patents.

The references disclosed herein, alone or in combination, contain an explicit and/or implicit teaching or motivation to combine them due to the following: (1) the knowledge generally available to a POSITA; (2) the prior art references as understood by a POSITA; (3) the nature of the problem to be solved; (4) the fact that each prior art reference addresses similar problems; and (5) the knowledge of a POSITA that the disclosed elements had been or could be used together.

As an example of those reasons and motivations to combine, Cole, Oestvall, Montemurro, Rao, Kelz, Scahill, Wyld, Van Megen, Maes, Vals, Araujo, Freund, Malomsoky, D'Amore, Lee, Brisebois, Senior, and the various Android and non-Android prior art systems all generally relate to or include network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. *See* Exs. A-01 through I-11; Exs. A-A through I-I. The prior art depicts, discloses, and discusses similar components and techniques for monitoring network, data, and battery usage, classifying whether applications are running in the foreground or background, and applying differential traffic control policies to save data and lengthen battery life, among other things. *Id.* Thus, a person of ordinary skill in the art would understand the teachings of the references and systems to be applicable to one another. A POSITA would have also found it obvious to implement (i.e., obvious to try) such combinations in order to utilize these well-known data saving, battery saving, and

network management techniques in a wireless end-user device capable of communicating data for Internet service activities over both wireless wide area networks and wireless local area networks.

Id.

For example, a POSITA would look to the primary and secondary references and systems discussed above to improve or tailor the disclosures thereof to help device manufacturers, wireless carriers, and customers reduce data usage and network congestion, extend battery life by decreasing power consumption, and enable users to stay connected. A POSITA would have understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage (e.g., by applying a traffic control policy based on whether an application is running in the foreground or background) when communicating over a WWAN.

For example, Android Devices running at least Android versions 1.0-2.2 did this before the alleged inventions.⁷ See Exs. A-10, B-10, C-10, D-10, E-10, F-10, G-10, H-10, I-10; see also, e.g., GOOG-HEADWATER-000000040 (“ConnectivityManager”), *id.* (“Monitor network connections (Wi-Fi, GPRS, UMTS, etc.”), GOOG-HEADWATER-000000041 (“getNetworkInfo”), *id.* (“TYPE_MOBILE = 0” and “TYPE_WIFI = 1”); GOOG-HEADWATER-000000042 (“Ensure that a network route exists to deliver traffic to the specified host via the specified network interface. An attempt to add a route that already exists is ignored, but treated as successful.”); GOOG-HEADWATER-000000035 (“This class gives you control of the power state of the device.”); GOOG-HEADWATER-000000001 (“You can use methods on this object to control the power state of the device.”); GOOG-HEADWATER-000000097 (noting that “[w]aking up in the

⁷ For Android versions 1.0-2.2, code from earlier versions carried over into later versions. Thus, any code cited from an earlier version of Android also exists in the later version.

background when the phone would otherwise be sleeping” “costs the most” battery life); GOOG-HEADWATER-000000101 (“Only update if WiFi or 3G is connected and not roaming”); GOOG-HEADWATER-000000106-11 (“Foreground apps”); GOOG-HEADWATER-000000112-18 (“Background apps”); GOOG-HEADWATER-000000118 (“Background apps . . . Checking current battery and network state before running a full update”), GOOG-HEADWATER-000000026 (“When the user leaves an application, its process is kept around in the background allowing it to continue working . . . if needed, and come immediately to the foreground if the user returns to it.”), *id.* (“A Service allows an application to implement longer-running background operations.”), *id.* (“The e-mail application schedules an alarm to wake up a service at regular intervals that looks for and retrieves any new mail.”); GOOG-HEADWATER-000000032 (“@return Whether background data usage is allowed . . . getBackgroundDataSetting . . . Whether an application should use data while it is in the background.”); GOOG-HEADWATER-000000033 (“Sets the persisted value for enabling/disabling Mobile data. . . Whether the mobile data connection should be used or not.”); GOOG-HEADWATER-000000029-34 (“If an application uses the network in the background, it should listen for this broadcast and stop using the background data if the value is false. . . If false, applications should not use the network if the application is not in the foreground.”); SAMSUNG_PRIORART0005048 (“Monitor network connections (Wi-Fi, GPRS, UMTS, et.c”)); SAMSUNG_PRIORART0005049 (“The setting for background data usage has changed values . . . If an application uses the network in the background, it should listen for this broadcast and stop using the background data if the value is false.”); SAMSUNG_PRIORART0005049 (“networkType == TYPE_WIFI || networkType == TYPE_MOBILE”); SAMSUNG_PRIORART0005049 (“TYPE_MOBILE = 0” and “TYPE_WIFI = 1”); SAMSUNG_PRIORART0005050-51 (“Ensure that a network route exists to

deliver traffic to the specified host via the specified network interface.”); SAMSUNG_PRIORART0005051 (“Returns the value of the setting for background data usage. If false, applications should not use the network if the application is not in the foreground. Developers should respect this setting, and check the value of this before performing any background data operations.”); SAMSUNG_PRIORART0005051 (“Whether background data usage is allowed . . . Sets the value of the setting for background data usage . . . Whether an application should use data while it is in the background . . . allowBackgroundData”); SAMSUNG_PRIORART0005487 at ConnectivityManager (“Monitor network connections (Wi-Fi, GPRS, UMTS, etc.)”); *id.* at NetworkInfo (“The device is on a network other than the home network (i.e., roaming)”); SAMSUNG_PRIORART0005350 at ConnectivityManager (“Returns the value of the setting for background data usage. If false, applications should not use the network if the application is not in the foreground.”); *id.* at NetworkInfo (“Indicates whether the device is currently roaming on this network. When {@code true}, it suggests that use of data on this network may incur extra costs.”); *id.* at ConnectivityService (“Create the network state trackers for Wi-Fi and mobile data.”); *id.* (“ConnectivityManager#getBackgroundDataSetting”); SAMSUNG_PRIORART0005353 at Fundamentals.jd (“To keep the music going, the media player activity could start a service to run in the background. The system would then keep the music playback service running even after the activity that started it leaves the screen.”); *id.* (“The entire task (the entire activity stack) can be brought to the foreground or sent to the background. . . . It is *active* or *running* when it is in the foreground of the screen (at the top of the activity stack for the current task). This is the activity that is the focus for the user's actions. . . . The foreground lifetime of an activity happens between a call to {@link android.app.Activity#onResume onResume()} until a corresponding call to {@link android.app.Activity#onPause onPause()}. “

During this time, the activity is in front of all other activities on screen and is interacting with the user. . . . A foreground process is one that is required for what the user is currently doing. . . A background process is one holding an activity that's not currently visible to the user."); SAMSUNG_PRIORART0005598 ("Background data . . . Enable background data usage"); *see generally* GOOG-HEADWATER-00000001-123; SAMSUNG_PRIORART0005042-5624.

Accordingly, a POSITA would find these goals and methods for achieving them obvious, would further seek to combine or modify the disclosure of any given primary and secondary references and/or systems to achieve those goals, and would have readily understood that doing so could increase device/network performance, improve user interactions and/or satisfaction, and reduce cost. *See, e.g.*, Oestvall [0009] ("[T]he fact that applications can run in the background and hence still consume some system resource is a waste of CPU and scheduler activity. And in the battery operated, portable device domain, it is especially valuable to conserve system resources wherever possible since doing so can increase battery life[.]"), [0021] ("Preserving system resources could be especially valuable not only in the context of portable, battery powered devices, but also a UPS (uninterruptible power supply) powered system: once activated because a primary power source has ceased to provide power, the need to preserve system resources for as long as possible is very valuable."); Senior at 3:41-60 ("[O]perating system specific changes are suggested to facilitate bandwidth resource management supplemented with a better design for devices so that devices are able to change their bandwidth requirements dynamically without significantly inconveniencing the users."), 8:45-55 ("The ability to make such preferences transparently, i.e., without requiring input from the user, is a particularly important benefit made possible in some embodiments. In the rapidly developing Internet environment it is to be expected that a variety of data streams may be accessed via USB devices connected to the Internet or other sources of data.

Transparent operation of the rebalancing-enabler module would give effect to user preferences to give an impression of a tunable seamless experience. Thus, the system would automatically focus on the activities of the greatest interest to the user.”); Cole at [0067] (“[A] user may not want to use a 3G network for fast connection because the use may incur added costs per connection.”), [0088] (“The user is in a public place and the lengthy transfer is conducted using the WWAN modem 230 (e.g., a 3G channel), which consumes significant battery power.”); Montemurro at [0003] (“Selection among the different radio access technologies may be driven by the different properties of the technologies such as bandwidth, range, cost, and power consumption, among other considerations.”); Rao at [0003] (teaching that “[i]t is desirable to provide application-aware, client-specific prioritization of packet traffic” to avoid situations where “a network packet generated or received for an application running in the background” is “processed ahead of a network packet generated or received for the application running in the foreground” “and currently in active use by the user”); Wyld at 5:3-19 (“The application can have both background and foreground tasks that access the network. For example, an email program has a foreground task that allows the user to create and then send new messages. While in background, the email program may need to periodically check a remote email server for new messages addressed to the user. In accordance with an embodiment of the invention, performing this checking for new email messages (or, more generally, executing a background task over the network) in response to receiving the signal of network activity idle time, helps make more efficient use of the network capability, thereby improving the user's experience with networking functions on the client device.”); Kelz at [0008] (mentioning that its “interplay between the applications, the various protocol stacks supplied by different companies and the wireless link is improved” and, “[a]s a result, the available resources in terms of bandwidth and transmission capacities can be exploited

more efficiently”); Scahill at [0010]-[0011] (“By coordinating a plurality of applications in their execution each task can be performed by one of the plurality of applications under suitable network conditions in a way which reduces or removes the likelihood of any conflict with other applications trying to also establish a connection over the same wireless communications link. Even when a wireless communications device can support more than, one network connection it is useful if conflicts can be resolved to ensure applications (and the performance of tasks which require a network connection) are co-ordinated as otherwise conflicts could still occur between applications. It is known in the art to configure a communications enabled device to continually scan for available networks and trigger applications when a particular network is available, particularly in the context of applications registering callbacks for various network interfaces.”), [0055]-[0056] (“An application scheduler according to this aspect of the invention system seeks to provide the advantage of only attempting to use a network when the network is expected to be available with sufficient quality and duration to satisfy the application requirements. An application scheduler according to this aspect of the invention also seeks to reduce wastage of device resources, for example, processing power and/or battery power, by eliminating unnecessary scanning operations and network connections. An application scheduler according to the invention also seeks to be capable of operating on a range of communications-enabled devices capable of communicating over a variety of network types, including devices with limited power and minimal processing capabilities such as java enabled feature phones.”); Van Megen at 1:6-23 (“Unfortunately, the default network connection may not be the best use of available network resources or may not be in the best interest of the user at the particular time. For example, there may be widely different data transfer rates between available networks and the default selection of a lower bandwidth connection may unduly increase download time or tie up processor capacity. Further, different

connection options may have different usage fees and the default network connection may not be the best value to the user at the time.”), 2:30-36 (“Because the cost to transfer data over a Wi-Fi connection is generally negligible compared to the cost per data unit (e.g., per megabyte (MB)) transferred over a GPRS connection, it may be desirable to use a Wi-Fi interface whenever possible. The same preference may be true with respect to the available bandwidth, which in general is much larger on a Wi-Fi network compared to a GPRS connection.”), 5:16-26 (noting that binding an application to WLAN prevents “unwanted costs for the user” which would be incurred if the application operated over “a more expensive network connection”); Maes at 1:32-39 (“[A]n access provider may offer a variety of different billing models to customers. Access providers may charge customers based on data traffic, based on services used (which can include access of content), or a combination of data traffic and service usage. With each of these models, the access provider may use a variety of different rating schemes. The rating schemes may be per usage, per levels of usage, per subscription, or combination of these schemes.”); Vals at [0018] (“embodiments of the invention are operable … to reduce the power draw of the device thereby reducing infrastructure power costs, among other benefits”); Araujo at [0001] (“Battery-powered machines have a finite amount of energy stored between charges, and these machines generally attempt to use the energy in a way that strikes a balance between providing functionality and maintaining longevity of the charge. Electricity is expensive, so even machines that are connected to power sources manage their use of energy in order to reduce the cost of operation.”), [0021] (“since a network card may use more power when transmitting than when idle, a network card … might be directed not to carry out a request in order to conserve power”); Freund at 10:33-37 (“[I]t is desirable to monitor the time an employee spends ‘actively’ interacting with the Internet, So that management goals of controlling counterproductive Web browsing can be realized.”), 11:21-28

(“Further, per application monitoring simplifies the task of tracking bandwidth utilization for a network, including providing detailed review on how the Internet access is being used. This greatly eases planning of hardware and connection requirements. Inadvertent disruptions of the network by individual users, such as bandwidth hording by a user using RealAudio for listening to a Web audio ‘broadcast,’ can be averted.”), 27:9-13 (“This allows an administrator, for instance, to Specify that a rule blocking a RealAudio application remains in force during working hours on weekdays—that is, at times when network traffic is already congested.”).

In particular, a POSITA would have been motivated to restrict network access for applications running in the background—especially when communicating over a WWAN or roaming—to conserve power, reduce network congestion, limit the impact such applications could have on applications running in the foreground, and reduce costly data usage associated with data-limited carrier service plans. *See, e.g.*, Oestvall at [0006] (noting that applications that “continue to run even when not actually in active use … will therefore continue to use some system resources, even when residing in the background”), [0024] (“One example use of the present invention is to prevent background … applications from polling for data over a wireless network, an activity that can potentially drain a battery quickly.”); Scahill at [0179] (“Since these applications are also executing effectively autonomously and in the ‘background’ ensuring that one application only runs at one time has the advantage of minimising computer processor unit (CPU) load thereby reducing the impact on any foreground applications that the user is interacting with.”); Montemurro at [0003]-[0004] (“Selection among the different radio access technologies may be driven by the different properties of the technologies such as bandwidth, range, cost, and power consumption, among other considerations…There are costs associated with application access from these different networks.”); Rao at [0003] (teaching that “[i]t is desirable to provide

application-aware, client-specific prioritization of packet traffic” to avoid situations where “a network packet generated or received for an application running in the background” is “processed ahead of a network packet generated or received for the application running in the foreground” “and currently in active use by the user”); GOOG-HEADWATER-000000040 (“Monitor network connections (Wi-Fi, GPRS, UMTS, etc.”), GOOG-HEADWATER-000000041 (“TYPE_MOBILE = 0” and “TYPE_WIFI = 1”); GOOG-HEADWATER-000000035 (“This class gives you control of the power state of the device.”); GOOG-HEADWATER-000000101 (“Only update if WiFi or 3G is connected and not roaming”), GOOG-HEADWATER-000000118 (“Background apps . . . Checking current battery and network state before running a full update”), GOOG-HEADWATER-000000026 (“When the user leaves an application, its process is kept around in the background allowing it to continue working . . . if needed, and come immediately to the foreground if the user returns to it.”), *id.* (“A Service allows an application to implement longer-running background operations.”), *id.* (“The e-mail application schedules an alarm to wake up a service at regular intervals that looks for and retrieves any new mail.”); GOOG-HEADWATER-00000001-123; GOOG-HEADWATER-000000029-34 (“If an application uses the network in the background, it should listen for this broadcast and stop using the background data if the value is false. . . If false, applications should not use the network if the application is not in the foreground.”); SAMSUNG_PRIORART0005048-51 (same); *see also* Exs. A-01 through I-11; Exs. A-A through I-I.

One of skill in the art would also have been motivated to combine the different publications and patents that were authored by employees of a given company or assigned to the same assignee and/or related to the same subject matter. Additionally, one of skill in the art would have been motivated to combine different references that were authored, developed, or invented by the same

individual(s) related to the same subject matter. The common inventor/author/architect of the references demonstrate that they relate to continued work in a common field of effort and continued related developments in that field. One of skill in the art would, therefore, combine the references related to each individual. Additionally, based on the teachings of the references and/or the knowledge of one of ordinary skill, one of skill in the art would have been motivated to combine different references from the same company. For example, a POSITA would have been motivated to combine at least Araujo, Vals, and Van Megen, all of which are currently assigned to the same company (e.g., Microsoft). And, one of skill in the art would have been motivated to combine prior art systems or products (e.g., SymbianOS) with any related or applicable patent or non-patent documentation or literature relating to that system or owned by the same entity (e.g., Oestvall), including for the reason that these materials are related. Similarly, one of skill in the art would have been motivated to combine prior art systems or products (e.g., Windows Mobile Devices, and Windows XP Devices) with any related or applicable patent or non-patent documentation or literature relating to that system or owned by the same entity (e.g., Araujo, Vals, and Van Megen), including for the reason that these materials are related.

Further, below are additional motivations to combine prior art for particular claim limitations. The following discussions of specific claim limitations are merely examples and are not limiting. For example, where a POSITA would have been motivated to combine references which together render obvious limitations from the independent claims, a POSITA would have also been motivated to combine said references in such a way as to render obvious various asserted dependent claims. The motivations identified with respect to any one Asserted Patent apply with equal force to any of the other Asserted Patents by virtue of their relationship and similarities.

a. '701 patent

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund, disclose this limitation. *See* Exs. A-01; A-03; A-05; A-06; A-08; A-10; *see also* A-A. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WWAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WWAN technology was well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund disclose a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. *See Exs. A-01; A-03; A-05; A-06; A-08; A-10 see also A-A.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WLAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WLAN modems and technology were well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the

POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach one or more processors, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose one or more processors. *See Exs. A-01-A-09; A-10; see also A-A.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of one or more processors was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include one or more processors. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach "one or more processors configured to determine, for a first end-user application . . . , whether the application is running in a background state or as a foreground application," it would have been obvious to a POSITA at the time of the invention to combine the

primary reference with any of the prior art that discloses “one or more processors configured to determine, for a first end-user application . . . , whether the application is running in a background state or as a foreground application.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund disclose this limitation. *See Exs. A-01; A-02; A-03; A-04; A-06; A-08; A-10; see also A-A.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage and/or system resources by determining whether applications running on a mobile device are operating in the foreground or background. Moreover, a POSITA would have been motivated to differentiate between foreground and background application processes to efficiently utilize and control the consumption of constrained network bandwidth, processing resources, and/or power consumption, among other system resources. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to determine, for a first end-user application . . . , whether the application is running in a background state or as a foreground application.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine

technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach “one or more processors configured to . . . selectively block and allow access by the first end-user application to the WWAN modem at a time when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN, wherein the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application,” it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses “one or more processors configured to . . . selectively block and allow access by the first end-user application to the WWAN modem at a time when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN, wherein the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund, disclose this limitation. *See Exs. A-01; A-02; A-03; A-04; A-06; A-08; A-10; see also A-A.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to

incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage (e.g., by applying a traffic control policy based on whether an application is running in the foreground or background) when communicating over a WWAN. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to . . . selectively block and allow access by the first end-user application to the WWAN modem at a time when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN, wherein the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit A-A. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D’Amore, Lee, Brisebois, and Aleksic disclose one or more of the asserted dependent claim limitations. *See Ex. A-A.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally

relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would also have been motivated to combine any of these references with any of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit A-A. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations

b. '184 patent

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund, disclose this limitation. *See* Exs. B-01; B-03; B-05; B-06; B-08; B-10; *see also* B-B. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus

constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WWAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WWAN technology was well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach one or more processors, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose one or more processors. *See Exs. B-01-B-09; B-10; see also B-B.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of one or more processors was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify

any of the primary references to include one or more processors. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach "one or more processors configured to . . . classify whether a particular application associated with an Internet service access request is interacting with the user in the device user interface foreground," it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses "one or more processors configured to . . . classify whether a particular application associated with an Internet service access request is interacting with the user in the device user interface foreground." For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund disclose this limitation. *See* Exs. B-01; B-02; B-03; B-04; B-06; B-08; B-10; *see also* B-B. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage and/or system resources by determining whether applications running on a

mobile device are operating in the foreground or background. Moreover, a POSITA would have been motivated to differentiate between foreground and background application processes to efficiently utilize and control the consumption of constrained network bandwidth, processing resources, and/or power consumption, among other system resources. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to . . . classify whether a particular application associated with an Internet service access request is interacting with the user in the device user interface foreground.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach “one or more processors configured to, for a time when data communication for Internet service activities is provided by the WWAN modem . . . apply a differential traffic control policy to the Internet service access request, based on . . . whether the application is classified as interacting with the user,” it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses “one or more processors configured to, for a time when data communication for Internet service activities is provided by the WWAN modem . . . apply a differential traffic control policy to the Internet service access request, based on . . . whether the application is classified as interacting with the user.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund, disclose this limitation. *See* Exs. B-01; B-02; B-03; B-04; B-06; B-08; B-10; *see also* B-B. It would have been obvious to a person skilled in the art to

incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage (e.g., by applying a traffic control policy based on whether an application is running in the foreground or background) when communicating over a WWAN. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to, for a time when data communication for Internet service activities is provided by the WWAN modem . . . apply a differential traffic control policy to the Internet service access request, based on . . . whether the application is classified as interacting with the user.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach for at least one of the first or second one or more applications, disallow Internet data communication for that application based on an application-specific amount of Internet data usage reaching a limit, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses for at least one

of the first or second one or more applications, disallow Internet data communication for that application based on an application-specific amount of Internet data usage reaching a limit. For example, several prior art references and systems, including at least Oestval, Rao, Kelz, Scahill, and Freund, disclose this limitation. *See* Exs. B-02; B-03; B-04; B-05; B-08; B-10; *see also* B-B. It would have been obvious to a person skilled in the art to incorporate such features to meet the shared goal of efficiently managing scarce resources (*e.g.*, battery life and/or data). For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. *See, e.g.*, Oestvall at [0004] (“Battery conservation in battery operated computing devices is very important[.]”). Moreover, limiting data usage to conserve system resources in a wireless communication device was well known in the art at least as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include for at least one of the first or second one or more applications, disallow Internet data communication for that application based on an application-specific amount of Internet data usage reaching a limit. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit B-B. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D’Amore, Lee, Brisebois, and

Aleksic disclose one or more of the asserted dependent claim limitations. *See* Ex. B-B. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would also have been motivated to combine any of these references with any of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit B-B. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

c. '578 patent

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund,

disclose a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN. *See* Exs. C-01; C-03; C-05; C-06; C-08; C-10; *see also* C-C. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WWAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WWAN technology was well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the at least one WLAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless local

area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the at least one WLAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund disclose a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the at least one WLAN. *See Exs. C-01; C-03; C-05; C-06; C-08; C-10; see also C-C.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WLAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WLAN modems and technology were well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the at least one WLAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach one or more processors, it would have been obvious to a POSITA at the

time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose one or more processors. *See Exs. C-01-C-09; C-10; see also C-C.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of one or more processors was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include one or more processors. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach "one or more processors configured to implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application, including whether the user-settable aspects of the policy only allow the particular application to utilize the at least one WWAN for Internet service activities when the particular application is classified as interacting with a user in the device user interface foreground," it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses "one or more processors

configured to implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application, including whether the user-settable aspects of the policy only allow the particular application to utilize the at least one WWAN for Internet service activities when the particular application is classified as interacting with a user in the device user interface foreground.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund, disclose this limitation. *See* Exs. C-01; C-02; C-03; C-04; C-06; C-08; C-10; *see also* C-C. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage (e.g., by applying a traffic control policy based on whether an application is running in the foreground or background) when communicating over a WWAN. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application, including whether the user-settable aspects of the policy only allow the particular application to utilize the at least one WWAN for Internet service activities when the particular application is classified as interacting with a user in the device user interface

foreground.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach “one or more processors configured to implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application . . . when the particular application is classified as interacting with a user in the device user interface foreground,” it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses “one or more processors configured to implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application . . . when the particular application is classified as interacting with a user in the device user interface foreground.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund disclose this limitation. *See Exs. C-01; C-02; C-03; C-04; C-06; C-08; C-10; see also C-C.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources,

increase battery life, reduce network congestion, and cut cost by limiting data usage and/or system resources by determining whether applications running on a mobile device are operating in the foreground or background. Moreover, a POSITA would have been motivated to differentiate between foreground and background application processes to efficiently utilize and control the consumption of constrained network bandwidth, processing resources, and/or power consumption, among other system resources. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application . . . when the particular application is classified as interacting with a user in the device user interface foreground.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit C-C. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D’Amore, Lee, Brisebois, and Aleksic disclose one or more of the asserted dependent claim limitations. *See Ex. C-C.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In

addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would also have been motivated to combine any of these references with any of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit C-C. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

d. '445 patent

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund, disclose a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN. *See Exs. D-01; D-03; D-05; D-06; D-08; D-10; see also D-D.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving

features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WWAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WWAN technology was well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund disclose a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. *See Exs. D-01; D-03; D-05; D-06; D-08; D-10; see also D-D.* It would have been obvious to a

person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WLAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WLAN modems and technology were well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach one or more processors, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose one or more processors. *See Exs. D-01-D-09; D-10; see also D-D.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous

art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of one or more processors was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include one or more processors. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach "one or more processors configured to . . . classify . . . , for a first end-user application . . . , whether a particular application associated with an Internet service access request . . . is interacting with the user in the device user interface foreground," it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses "one or more processors configured to . . . classify . . . , for a first end-user application . . . , whether a particular application associated with an Internet service access request . . . is interacting with the user in the device user interface foreground." For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund disclose this limitation. *See* Exs. D-01; D-02; D-03; D-04; D-06; D-08; D-10; *see also* D-D. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to

improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage and/or system resources by determining whether applications running on a mobile device are operating in the foreground or background. Moreover, a POSITA would have been motivated to differentiate between foreground and background application processes to efficiently utilize and control the consumption of constrained network bandwidth, processing resources, and/or power consumption, among other system resources. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to . . . classify . . . , for a first end-user application . . . , whether a particular application associated with an Internet service access request . . . is interacting with the user in the device user interface foreground.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach “one or more processors configured to . . . apply a differential traffic control policy to the Internet service access request, based on [whether data for nternet service activities is to be communicated through the WWAN modem or the WLAN modem and whether a particular application . . . is interacting with the user in the device user interface foreground],” it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses “one or more processors configured to . . . apply

a differential traffic control policy to the Internet service access request, based on [whether data for nternet service activities is to be communicated through the WWAN modem or the WLAN modem and whether a particular application . . . is interacting with the user in the device user interface foreground].” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund, disclose this limitation. *See* Exs. D-01; D-02; D-03; D-04; D-06; D-08; D-10; *see also* D-D. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage (e.g., by applying a traffic control policy based on whether an application is running in the foreground or background) when communicating over a WWAN. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to . . . apply a differential traffic control policy to the Internet service access request, based on [whether data for nternet service activities is to be communicated through the WWAN modem or the WLAN modem and whether a particular application . . . is interacting with the user in the device user interface foreground].” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the

POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit D-D. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D'Amore, Lee, Brisebois, and Aleksic disclose one or more of the asserted dependent claim limitations. *See Ex. D-D.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would also have been motivated to combine any of these references with any of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit D-D. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

e. **'224 patent**

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach at least one wireless modem, it would have been obvious to a POSITA at the time of the

invention to combine the primary reference with any of the prior art that discloses at least one wireless modem. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund, disclose at least one wireless modem. *See Exs. E-01; E-03; E-05; E-06; E-08; E-10; see also E-E.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that wireless connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, wireless technology was well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include at least one wireless modem. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a processor, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose a processor. *See Exs. E-01-E-09; E-10; see also E-E.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each

of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of a processor was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a processor. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach for each given application of a plurality of applications on the wireless end-user device, monitor a network service usage activity of the wireless end-user communications device associated with the given application, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses for each given application of a plurality of applications on the wireless end-user device, monitor a network service usage activity of the wireless end-user communications device associated with the given application. For example, several prior art references and systems, including at least Cole, Oestvall, Kelz, Scahill, and Wyld, disclose for each given application of a plurality of applications on the wireless end-user device, monitor a network service usage activity of the wireless end-user communications device associated with the given application. *See* Exs. E-01; E-02; E-04; E-05; E-06; E-10; *see also* E-E. It would have been obvious to a person skilled in the art to incorporate such functionality, at least because these references shared the goal of efficiently utilizing system

resources by prioritizing certain resource-intensive activity (*e.g.*, applications accessing a wireless network). Moreover, it was well known in the art to utilize network monitoring techniques (such as those disclosed in Cole, Oestvall, Kelz, Scahill, and/or Wyld) to optimize system resource usage. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include for each given application of a plurality of applications on the wireless end-user device, monitor a network service usage activity of the wireless end-user communications device associated with the given application. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach "a processor configured to . . . manage network data access via the at least one wireless modem for each of the plurality of applications according to the dynamically selected service usage control policy for each given network service activity of that application," it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses "a processor configured to . . . manage network data access via the at least one wireless modem for each of the plurality of applications according to the dynamically selected service usage control policy for each given network service activity of that application." For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund, disclose this limitation. *See Exs. E-01; E-02; E-03; E-04; E-06; E-08; E-10; see also E-E.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would

understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage (e.g., by managing network access) when communicating over a wireless network. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “a processor configured to . . . manage network data access via the at least one wireless modem for each of the plurality of applications according to the dynamically selected service usage control policy for each given network service activity of that application.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a memory coupled to the processor and configured to provide the processor with instructions, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a memory coupled to the processor and configured to provide the processor with instructions. For example, several prior art references and systems, including at least Cole, Rao, Scahill, Wyld, Araujo, Freund, and Senior, disclose a memory coupled to the processor and configured to provide the processor with

instructions. *See* Exs. E-01; E-03; E-05; E-06; E-07; E-08; E-09; E-10; *see also* E-E. It would have been obvious to a person skilled in the art to incorporate such features at least because each of these references relate generally to computing devices, for which a POSITA would understand that memory was a necessary constituent. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a memory coupled to the processor and configured to provide the processor with instructions. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit E-E. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D'Amore, Lee, Brisebois, and Aleksic disclose one or more of the asserted dependent claim limitations. *See* Ex. E-E. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would also have been motivated to combine any of these references with any of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market

forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit E-E. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

f. '976 patent

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund, disclose a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN. *See Exs. F-01; F-03; F-05; F-06; F-08; F-10; see also F-F.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WWAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WWAN technology was well known as of the critical date and

commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund disclose a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. *See Exs. F-01; F-03; F-05; F-06; F-08; F-10; see also F-F.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would

understand that WLAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WLAN modems and technology were well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach one or more processors, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose one or more processors. *See Exs. F-01-F-09; F-10; see also F-F.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of one or more processors was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include one or more processors. A POSITA would also have had

a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach “one or more processors configured to classify, for a first end-user application . . . , whether or not the first end-user application, when running, is interacting in the device display foreground with the user,” it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses “one or more processors configured to classify, for a first end-user application . . . , whether or not the first end-user application, when running, is interacting in the device display foreground with the user.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund disclose this limitation. *See* Exs. F-01; F-02; F-03; F-04; F-06; F-08; F-10; *see also* F-F. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage and/or system resources by determining whether applications running on a mobile device are operating in the foreground or background. Moreover, a POSITA would have been motivated

to differentiate between foreground and background application processes to efficiently utilize and control the consumption of constrained network bandwidth, processing resources, and/or power consumption, among other system resources. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “one or more processors configured to classify, for a first end-user application . . . , whether or not the first end-user application, when running, is interacting in the device display foreground with the user.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach “a processor configured to . . . for a time period when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN, apply a first differential traffic control policy to Internet service activity on behalf of the first end-user application, such that Internet service activity on behalf of the first end-user application is disallowed when the one or more processors classify the first end-user application as not interacting in the device display foreground with the user,” it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses “a processor configured to . . . for a time period when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN, apply a first differential traffic control policy to Internet service activity on behalf of the first end-user application, such that Internet service activity on behalf of the first end-user application is disallowed when the one or more processors classify the first end-user application as not

interacting in the device display foreground with the user.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund, disclose this limitation. *See* Exs. F-01; F-02; F-03; F-04; F-06; F-08; F-10; *see also* F-F. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage (e.g., by applying a traffic control policy based on whether an application is running in the foreground or background) when communicating over a WWAN. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “a processor configured to . . . for a time period when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN, apply a first differential traffic control policy to Internet service activity on behalf of the first end-user application, such that Internet service activity on behalf of the first end-user application is disallowed when the one or more processors classify the first end-user application as not interacting in the device display foreground with the user.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine

technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit F-F. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D'Amore, Lee, Brisebois, and Aleksic disclose one or more of the asserted dependent claim limitations. *See Ex. F-F.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would also have been motivated to combine any of these references with any of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit F-F. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

g. '433 patent

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless wide area network (WWAN) modem to communicate data for Internet service

activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN, the at least one WWAN having a corresponding network type of a plurality of wireless network types supported by the device for data communication. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund, disclose a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN. *See Exs. G-01; G-03; G-05; G-06; G-08; G-10; see also G-G.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WWAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WWAN technology was well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the

POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a non-transitory memory to store a network service activity control policy set, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a non-transitory memory to store a network service activity control policy set. For example, several prior art references and systems, including at least Cole, Rao, Scahill, Wyld, Araujo, Freund, and Senior, disclose a memory coupled to the processor and configured to provide the processor with instructions. *See Exs. G-01; G-03; G-05; G-06; G-07; G-08; G-09; G-10; see also G-G.* It would have been obvious to a person skilled in the art to incorporate such features at least because each of these references relate generally to computing devices, for which a POSITA would understand that memory was a necessary constituent. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a non-transitory memory to store a network service activity control policy set. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach one or more processors, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose one or more processors.

See Exs. G-01-G-09; G-10; see also G-G. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of one or more processors was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include one or more processors. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit G-G. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D'Amore, Lee, Brisebois, and Aleksic disclose one or more of the asserted dependent claim limitations. *See Ex. G-G.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data

usage. A POSITA would also have been motivated to combine any of these references with any of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit G-G. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

h. '544 patent

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless modem to communicate data for network service usage activities between the device and a wireless network, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless modem to communicate data for network service usage activities between the device and a wireless network. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund, disclose a wireless modem to communicate data for network service usage activities between the device and a wireless network. *See Exs. H-01; H-03; H-05; H-06; H-08; H-10; see also H-H.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that WWAN connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, WWAN technology was well known as of the critical date and commonly used to connect mobile

devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless modem to communicate data for network service usage activities between the device and a wireless network. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach one or more processors, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose one or more processors. *See Exs. H-01-H-09; H-10; see also H-H.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of one or more processors was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include one or more processors. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge,

disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach “a processor that executes instructions to associate network service usage activity, on behalf of a first device application, and that occurs when the first device application is not in the foreground of user interaction, with a network service usage control policy,” it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a processor that executes instructions to associate network service usage activity, on behalf of a first device application, and that occurs when the first device application is not in the foreground of user interaction, with a network service usage control policy.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund disclose this limitation. *See* Exs. H-01; H-02; H-03; H-04; H-06; H-08; H-10; *see also* H-H. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage and/or system resources by determining whether applications running on a mobile device are operating in the foreground or background. Moreover, a POSITA would have been motivated to differentiate between foreground and background application processes to

efficiently utilize and control the consumption of constrained network bandwidth, processing resources, and/or power consumption, among other system resources. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a processor that executes instructions to associate network service usage activity, on behalf of a first device application, and that occurs when the first device application is not in the foreground of user interaction, with a network service usage control policy.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach “a processor that executes instructions to . . . dynamically determine whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state,” it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses “a processor that executes instructions to . . . dynamically determine whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state.” For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, Freund, and Vals, disclose this limitation. *See* Exs. H-01; H-02; H-03; H-04; H-06; H-08; H-10; H-H. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity

management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage (e.g., by applying a traffic control policy based on whether an application is running in the foreground or background and/or a power control state of the device) when communicating over a wireless network. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “a processor that executes instructions to . . . dynamically determine whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a memory coupled to the processor to provide the processor with the instructions, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a memory coupled to the processor to provide the processor with the instructions. For example, several prior art references and systems, including at least Cole, Rao, Scahill, Wyld, Araujo, Freund, and Senior, disclose a memory coupled to the processor and configured to provide the processor with instructions. *See Exs. H-01; H-03; H-05; H-06; H-07; H-08; H-09; H-10; see also H-H.* It would have been obvious to a

person skilled in the art to incorporate such features at least because each of these references relate generally to computing devices, for which a POSITA would understand that memory was a necessary constituent. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a memory coupled to the processor to provide the processor with the instructions. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach "dynamically assigning a network capacity controlled services priority level to the particular network service usage based on a network busy state," it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses "dynamically assigning a network capacity controlled services priority level to the particular network service usage based on a network busy state." For example, several prior art references, including at least Lee, Montemurro, and Aleksic, disclose a memory coupled to the processor and configured to provide the processor with instructions. *See Ex. H-H.* It would have been obvious to a person skilled in the art to incorporate such features at least because each of these references relate generally to optimizing computing device resources and network utilization. For example, a POSITA would have found it obvious to modify any of the primary references to include such features at least because such features improve network bandwidth usage efficiency and, in turn, reduce system resource requirements and/or more efficiently allocate those resources. Thus, design and market forces would have motivated a POSITA to modify any

of the primary references to include “dynamically assigning a network capacity controlled services priority level to the particular network service usage based on a network busy state.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit H-H. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D’Amore, Lee, Brisebois, and Aleksic disclose one or more of the asserted dependent claim limitations. *See Ex. H-H.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would also have been motivated to combine any of these references with any of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit H-H. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated

teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

i. '773 patent

To the extent that any primary reference is deemed not to anticipate a claim for failing to teach a processor, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses one or more processors. For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Scahill, Wyld, Araujo, Freund, and Senior, disclose a processor. *See* Exs. I-01-I-10; *see also* I-I. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that the inclusion of a processor was a routine design choice, commonly implemented in mobile devices as of the critical date. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a processor. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a wireless modem to communicate data for network service usage activities between the device and a wireless network, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a wireless modem to communicate data for network service usage activities between the device

and a wireless network. For example, several prior art references and systems, including at least Cole, Rao, Wyld, Scahill, and Freund, disclose a wireless modem to communicate data for network service usage activities between the device and a wireless network. *See Exs. I-01; I-03; I-05; I-06; I-08; I-10; see also I-I.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would understand that wireless connections and modems were routine design choices available for mobile systems as of the critical date. Moreover, wireless technology was well known as of the critical date and commonly used to connect mobile devices to the internet. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a wireless modem to communicate data for network service usage activities between the device and a wireless network. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach a non-transitory computer-readable storage medium storing instructions, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses a non-transitory computer-readable storage medium storing instructions. For example, several prior art references and systems, including at least Cole, Rao, Scahill, Wyld, Araujo, Freund, and Senior, disclose a memory coupled to the

processor and configured to provide the processor with instructions. *See* Exs. I-01; I-03; I-05; I-06; I-07; I-08; I-09; I-10; *see also* I-I. It would have been obvious to a person skilled in the art to incorporate such features at least because each of these references relate generally to computing devices, for which a POSITA would understand that memory was a necessary constituent. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include a non-transitory memory to store a network service activity control policy set. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach "a non-transitory computer-readable storage medium storing instructions that, when provided to the processor, cause the processor to . . . select a corresponding current service usage control policy for the background network service usage activities," it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses "a non-transitory computer-readable storage medium storing instructions that, when provided to the processor, cause the processor to . . . select a corresponding current service usage control policy for the background network service usage activities." For example, several prior art references and systems, including at least Cole, Oestvall, Rao, Kelz, Wyld, and Freund disclose this limitation. *See* Exs. I-01; I-02; I-03; I-04; I-06; I-08; I-10; *see also* I-I. It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network

connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would have also understood and been aware of motivations to conserve system resources, increase battery life, reduce network congestion, and cut cost by limiting data usage and/or system resources by determining whether applications running on a mobile device are operating in the foreground or background. Moreover, a POSITA would have been motivated to differentiate between foreground and background application processes to efficiently utilize and control the consumption of constrained network bandwidth, processing resources, and/or power consumption, among other system resources. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include “a non-transitory computer-readable storage medium storing instructions that, when provided to the processor, cause the processor to . . . select a corresponding current service usage control policy for the background network service usage activities.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach allow each of the background network service usage activities to access the WWAN during the respective deferred time slot for that background network service usage activity, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses allow each of the background network

service usage activities to access the WWAN during the respective deferred time slot for that background network service usage activity. For example, several prior art references and systems, including at least Cole, Oestvall, and Scahill, disclose this limitation. *See Exs. I-01; I-02; I-05; I-10; see also I-I.* It would have been obvious to a person skilled in the art to incorporate such features into any of the primary references. For, example, it would have been obvious to implement techniques for optimized system resource usage/allocation (such as those disclosed in Cole, Oestvall, and/or Scahill) into the device disclosed in any primary reference. It was known in the art that wireless communications devices require optimized resource usage because of their limited power (e.g., battery). Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include allow each of the background network service usage activities to access the WWAN during the respective deferred time slot for that background network service usage activity. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate a claim for failing to teach service usage policy application based on "a network busy state," it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art that discloses service usage policy application based on "a network busy state." For example, several prior art references, including at least Lee, Montemurro, and Aleksic, disclose a memory coupled to the processor and configured to provide the processor with instructions. *See Ex. I-I; I-10.* It would have been obvious to a person skilled in the art to

incorporate such features at least because each of these references relate generally to optimizing computing device resources and network utilization. For example, a POSITA would have found it obvious to modify any of the primary references to include such features at least because such features improve network bandwidth usage efficiency and, in turn, reduce system resource requirements and/or more efficiently allocate those resources. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include service usage policy application based on “a network busy state.” A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA’s knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

As another example, to the extent that any primary reference is deemed not to anticipate one or more of the dependent claims, it would have been obvious to a POSITA at the time of the invention to combine the primary reference with any of the prior art discussed in Exhibit I-I. For example, Montemurro, Van Megen, Maes, Vals, Malomsoky, D’Amore, Lee, Brisebois, and Aleksic disclose one or more of the asserted dependent claim limitations. *See Ex. I-I.* It would have been obvious to a person skilled in the art to incorporate such functionality, components, and/or features. For example, a POSITA would understand that each of these references generally relate to network data saving features, battery saving features, and network connectivity management functions, and thus constitute analogous art within the same field of endeavor. In addition, a POSITA would be motivated to incorporate such functionality in order to improve device performance, improve battery life and efficiency, and reduce costs associated with data usage. A POSITA would also have been motivated to combine any of these references with any

of the primary references for the reasons discussed in Section IV.B.2. Thus, design and market forces would have motivated a POSITA to modify any of the primary references to include the features described in Exhibit I-I. A POSITA would also have had a reasonable expectation of success in making such modifications to any primary reference. A POSITA would have understood that these references, as well as the POSITA's knowledge, disclose interrelated teachings based on routine technologies and would have been amenable to various well-understood and predictable combinations.

3. Lack of Secondary Indicia of Nonobviousness

Samsung is not aware of any evidence that would tend to establish any secondary considerations of non-obviousness. This lack of evidence further renders the Asserted Claims obvious. Proving any such secondary considerations is Headwater's burden. *See, e.g., ZUP, LLC v. Nach Mfg., Inc.*, 896 F.3d 1365, 1373 (Fed. Cir. 2018) ("[A] patentee bears the burden of production with respect to evidence of secondary considerations of nonobviousness."). Accordingly, Samsung reserves all rights regarding its full contention in this respect until after Headwater completes its final and binding disclosure of any such evidence and contentions. In the meantime, Samsung note the complete lack of any such evidence in the record.

Headwater has disclosed no evidence of, and Samsung knows of no viable evidence to suggest:

- **The alleged invention's commercial success.** Indeed, no products are known to practice the Asserted Claims. To the extent Headwater asserts that Samsung's products practice the Asserted Patents, Samsung denies that assertion and incorporates its responses to date and any future contentions, expert reports, and testimony. Further, Samsung knows of no nexus between any commercial success and the Asserted Claims.

See, e.g., Windsurfing Int'l Inc. v. AMF, 782 F.2d 995 (Fed. Cir. 1986) (considerations such as intervening, non-covered technological innovations, popularity of accessories, and advertising expense are all relevant to the nexus determination). If any commercial success is due to any of the concepts discussed in the Asserted Patents, those concepts are also present in the prior art, as described above, and thus do not support any commercial success that is relevant to the question of obviousness. *See Tokai Corp. v. Easton Enters, Inc.*, 632 F.3d 1358, 1369–70 (Fed. Cir. 2011) (“If commercial success is due to an element in the prior art, no nexus exists.”); *In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (“Where the offered secondary consideration actually results from something other than what is both claimed and *novel* in the claim, there is no nexus to the merits of the claimed invention.”); *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312 (Fed. Cir. 2006) (“[I]f the feature that creates the commercial success was known in the prior art, the success is not pertinent.”).

- **Alleged commercial success via licensing.** Headwater has presented no evidence of commercial success via a licensing program.
- **Long felt but unresolved needs.** Headwater has presented no evidence of any long felt and unresolved need.
- **No industry praise.** There is also no evidence of industry praise for the alleged invention of the Asserted Patents or any functionality that allegedly practices the Asserted Patents. To the extent any praise is related to any functionality that allegedly practices the Asserted Patents, that praise is not due to the allegedly novel features of the Asserted Patents, but instead only to features present in the prior art, which is not a sufficient nexus to be relevant to the question of industry praise for purposes of

obviousness. *See Muniauction, Inc. v. Thomson Corp.*, 532 F.3d 1318, 1328 (Fed. Cir. 2008). Praise of Samsung's mobile phones or of certain Google Android features is not praise of the Asserted Patents.

- **Unexpected results:** No evidence of any such unexpected results is known. As discussed above, the concepts contained in the Asserted Claims were already combined in the same manner as the asserted. These prior art systems, as described in the above-referenced exhibits, disclosed the same combination of elements, and the same result of that combination, that is recited in the claim. Thus, there were no unexpected results that arose from combining the well-known elements in the Asserted Claims.
- **The failure of others.** No evidence of any such failure is known.
- **Skepticism by experts.** No experts or person of skill expressed skepticism about implementing the alleged inventions.
- **Teaching away by others.** No evidence of any such teaching is known.
- **Recognition of a problem.** As discussed above, the industry recognized the problem and had already discussed multiple approaches that implemented the Asserted Claims to solve that problem.
- **Copying of the alleged invention by competitors.** No evidence of any such copying is known. *See Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1366 (Fed. Cir. 2001) (allegedly copied feature must be an embodiment of the patented claims).

V. OBVIOUSNESS-TYPE DOUBLE PATENTING

Each of the claims identified below is invalid due to obviousness-type double patenting. As the Federal Circuit discussed in *In re Hubbell*, obviousness-type double patenting has two separate and independent rationales:

There are two justifications for obviousness-type double patenting. The first is “to prevent unjustified timewise extension of the right to exclude granted by a patent no matter how the extension is brought about.” *Van Ornum*, 686 F.2d at 943-44 (quotation and citation omitted). The second rationale is to prevent multiple infringement suits by different assignees asserting essentially the same patented invention. *Fallaux*, 564 F.3d at 1319 (recognizing that “harassment by multiple assignees” provides “a second justification for obviousness-type double patenting”); *see also* Chisum on Patents § 9.04[2][b][ii] (“The possibility of multiple suits against an infringer by assignees of related patents has long been recognized as one of the concerns behind the doctrine of double patenting.”).

See In re Hubbell, 709 F.3d 1140, 1145 (Fed. Cir. 2013).

Analyzing obviousness-type double patenting takes a two-step process. First, the differences between the claims of the patent being used as a reference and the claims at issue are identified. *Georgia-Pacific v. US Gypsum*, 195 F.3d 1322, 1326 (Fed. Cir. 1999) (“[A]nalysis of the claims at issue is the first step in determining if the second invention is merely an obvious variation of the first.... Because these two claims are so similar, we must look to see if there is anything to distinguish claim 1 of the ’989 patent from claim 1 of the ’569 patent. There are two differences between these claims.”), *amended on rehearing*, 204 F.3d 1359 (Fed. Cir. 2000).

Second, whether those differences raise a patentable distinction must be determined. *Georgia-Pacific*, 195 F.3d at 1328 (finding that “[t]hese differences are not sufficient to render the claims patentably distinct”). “A later patent claim ‘is not patentably distinct from an earlier claim if the later claim is obvious over, or anticipated by, the earlier claim.’” *Hubbell*, 709 F.3d at 1145 (quoting *Eli Lilly & Co. v. Barr Labs., Inc.*, 251 F.3d 955, 968 (Fed. Cir. 2001)). Where the recited claims at issue are not explicitly disclosed in the claims of the patent being used as a reference, Samsung may rely on the knowledge of a person of ordinary skill in the art, admitted prior art, or disclosure in the prior art references relied upon by Samsung.

A. '544 patent

Claim 1 of the '544 patent is invalid due to obviousness-type double patenting in view of the claimed invention in at least the separately-asserted '433 patent. The '544 and '433 patents share common inventors and are related for double patenting purposes. The '433 patent expires before the '544 patent, and therefore qualifies as a double patenting reference. The '433 patent expires on March 2, 2029, while the '544 patent expires on February 3, 2030. *See Gilead Scis., Inc. v. Natco Pharma Ltd.*, (holding that an earlier expiring patent would “qualify as an obviousness-type double patenting reference for a later-expiring patent”); *Abbvie v. Mathilda & Terence Kennedy Institute*, 764 F.3d 1355, 1373 (finding the crucial purpose of the obviousness-type double patenting doctrine “to prevent an inventor from securing a second, later expiring patent for the same invention” still exists, due, for example, to patents that have “different patent terms due to examination delays at the PTO”).

A table showing the overlap in claim language between claim 1 of the '544 patent and claims 1, 2, and 13 of the '433 patent is provided below:

'544 Patent Claim 1	'433 Patent Claim 1
A wireless end-user device, comprising: a wireless modem to communicate data for network service usage activities between the device and a wireless network;	A wireless end-user device, comprising: a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN, the at least one WWAN having a corresponding network type of a plurality of wireless network types supported by the device for data communication;
	a non-transitory memory to store a network service activity control policy set, the policy set including at least a first differential traffic control policy element associating one or more Internet activity access controls with at least a first end-user application; and
	one or more processors configured to

<p>a processor that executes instructions to associate network service usage activity, on behalf of a first device application, and that occurs when the first device application is not in the foreground of user interaction, with a network service usage control policy,</p>	<p>access the network service activity control policy set, determine whether to apply the one or more Internet activity access controls with respect to a first Internet access request by or on behalf of the first end-user application, based at least on which of the plurality of wireless network types is to provide data communication for Internet access requests, and when the one or more Internet activity access controls are to be applied, apply the one or more Internet activity access controls to aggregate network activity for the first Internet access request with network activity for one or more other data communication requests, which are otherwise not associated with the first end-user application, before allowing network activity in association with the first Internet access request.</p>
	<p>'433 Patent Claim 2</p> <p>2. The wireless end-user device of claim 1, wherein the first end-user application is capable of both interacting with a user in a user interface foreground of the device, and at least some Internet service activities when not interacting with a user in the device user interface foreground, the one or more processors further configured to</p>
<p>set an application state indicating whether the first device application, associated with a particular network service usage activity, is in the foreground of user interaction, and</p>	<p>classify whether the first end-user application is interacting with the user in the device user interface foreground, and</p>
<p>dynamically determine whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state; and</p>	<p>determine whether to apply the one or more Internet activity access controls based also on the classification of whether the first end-user application is interacting with the user.</p>
<p>a memory coupled to the processor to provide the processor with the instructions.</p>	<p>'433 Patent Claim 13</p> <p>The wireless end-user device of claim 1, wherein the one or more processors are further configured to dynamically change the determination of whether to apply the one or</p>

	more Internet activity access controls based on a power state of the device.
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While the claims of the '433 patent contain minor linguistic differences from the independent claim of the '544 patent, none of those differences renders the independent claim of the '544 patent as a whole patentably distinct from the claims in the '433 patent. Like claim 1 of the '544 patent, claims 1, 2 and 13 of the '433 patent—taken together—teach a “wireless end-user device, comprising”: (1) a wireless modem to communicate data for Internet (i.e., network) service activities between the device and a wireless network (claim 1 of the '433 patent); (2) a processor configured to access the network service activity policy set and associate the network service activity with a first application (claim 1 of the '433 patent) when the application is not in the foreground of user interaction (claim 2 of the '433 patent), set an application state by classifying whether the first application is in the foreground of user interaction (claim 2 of the '433 patent), and determine whether to apply the control policy based on the application state (claim 2 of the '433 patent) and based on a power control state (claim 13 of the '433 patent); and (3) a memory (claim 1 of the '433 patent).

It would have been obvious to a POSITA that the “wireless wide area network (WWAN) modem” of claim 1 of the '433 patent is a “wireless modem” as required by claim 1 of the '544 patent. A POSITA would have also found “communicat[ing] data for network service usage activities between the device and a wireless network” ('544 patent claim 1) obvious in view of claim 1 of the '433 patent’s requirement for “communicat[ing] data for Internet service activities between the device and at least one WWAN” ('433 patent claim 1). A POSITA would have also found “execut[ing] instructions to associate network service usage activity, on behalf of a first device application … with a network service usage control policy” ('544 patent claim 1) obvious in view of claim 1 of the '433 patent, which requires “access[ing] the network service activity

control policy set,” and “determin[ing] whether to apply the one or more Internet activity access controls with respect to a first Internet access request by or on behalf of the first end-user application” ('433 patent claim 1). A POSITA would have found “execut[ing] instructions to associate network service usage activity, on behalf of a first device application... when the first device application is not in the foreground of user interaction” ('544 patent claim 1) obvious in view of claim 2 of the '433 patent, which requires “at least some Internet service activities when not interacting with a user in the device user interface foreground.” A POSITA would have also found “set[ting] an application state indicating whether the first device application, associated with a particular network service usage activity, is in the foreground of user interaction” ('544 patent claim 1) obvious in view of claim 2 of the '433 patent, which requires “classify[ing] whether the first end-user application is interacting with the user in the device user interface foreground.” And finally, a POSITA would have found “determin[ing] whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state” ('544 patent claim 1) obvious in view of claims 2 and 13 of the '433 patent, which require “determin[ing] whether to apply the one or more Internet activity access controls based also on the classification of whether the first end-user application is interacting with the user [i.e., in the foreground]” and “dynamically chang[ing] the determination of whether to apply the one or more Internet activity access controls based on a power state of the device,” respectively.

Another table showing the overlap in claim language between claims 2, 3, 7, 11, 17, and 23 of the '544 patent and claims 3, 4, 13, 10, 16, and 18 of the '433 patent, respectively, is provided below:

'544 Patent Claim 2	'433 Patent Claim 3
The wireless end-user device of claim 1, wherein the processor executing the instructions determines that the first device application is in the foreground of user interaction when the user of the device is directly interacting with that application or perceiving any benefit from that application.	The wireless end-user device of claim 2, wherein the one or more processors are configured to classify that the first end-user application is interacting with the user in the device user interface foreground when the user of the device is directly interacting with that application or perceiving any benefit from that application.
'544 Patent Claim 3	'433 Patent Claim 4
The wireless end-user device of claim 1, wherein the processor executing the instructions determines that the first device application is in the foreground of user interaction based on a state of user interface priority for the application.	The wireless end-user device of claim 2, wherein the one or more processors are configured to classify that the first end-user application is interacting with the user in the device user interface foreground based on a state of user interface priority for the application.
'544 Patent Claim 7	'433 Patent Claim 13
The wireless end-user device of claim 1, wherein the power control state is a power state of the device.	The wireless end-user device of claim 1, wherein the one or more processors are further configured to dynamically change the determination of whether to apply the one or more Internet activity access controls based on a power state of the device.
'544 Patent Claim 11	'433 Patent Claim 10
The wireless end-user device recited in claim 1, wherein dynamically determining whether to apply the network service usage control policy to the particular network service usage activity is further based on a current wireless network and/or the network service usage control policy is based on a current wireless network.	The wireless end-user device of claim 1, wherein the one or more processors are further configured to select the first differential traffic control policy element from the network service activity control policy set based at least in part on which of the plurality of wireless network types is to provide data communication for Internet access requests.
'544 Patent Claim 17	'433 Patent Claim 16
The wireless end-user device recited in claim 1, wherein the network service usage control policy includes traffic control policy filters using a network busy state and/or a time of day as an index into a traffic control setting.	The wireless end-user device of claim 1, wherein the one or more Internet activity access controls further limit the allowed network activity to particular time windows.
'544 Patent Claim 23	'433 Patent Claim 18
The wireless end-user device of claim 1, wherein the power control state is a power state of the wireless modem.	The wireless end-user device of claim 1, wherein the one or more Internet activity access controls further prevent the first Internet access request from causing a change to a power state of the modem.

While the dependent claims of the '433 patent contain minor linguistic differences from the dependent claims of the '544 patent, none of those differences renders the above dependent claims of the '544 patent as a whole patentably distinct from the claims in the '433 patent. For example, a POSITA would have found “determin[ing] that the first device application is in the foreground of user interaction when the user of the device is directly interacting with that application or perceiving any benefit from that application” ('544 patent claim 2) obvious in view of claim 3 of the '433 patent, which requires “classify[ing] that the first end-user application is interacting with the user in the device user interface foreground when the user of the device is directly interacting with that application or perceiving any benefit from that application.” A POSITA would have further found a “processor executing the instructions determines that the first device application is in the foreground of user interaction based on a state of user interface priority for the application” ('544 patent claim 3) obvious in view of claim 4 of the '433 patent, which requires a processor “configured to classify that the first end-user application is interacting with the user in the device user interface foreground based on a state of user interface priority for the application.” A POSITA would have also found “wherein the power control state is a power state of the device” ('544 patent claim 7) obvious in view of claim 13 of the '433 patent, which also discusses using the “power state of the device.” A POSITA would have found “determining whether to apply the network service usage control policy to the particular network service usage activity is further based on a current wireless network and/or the network service usage control policy is based on a current wireless network” ('544 patent claim 11) obvious in view of claim 10 of the '433 patent, which requires “select[ing] the first differential traffic control policy element from the network service activity control policy set based at least in part on which of the plurality of wireless network types is to provide data communication for Internet access requests.” Indeed,

both claim 11 of the '544 patent and claim 10 of the '433 patent cover deciding whether to apply a network service usage control policy / differential traffic control policy from the network service activity control policy set based on the wireless network. A POSITA would have also found "the network service usage control policy includes traffic control policy filters using ... a time of day" ('544 patent claim 17) obvious in view of claim 16 of the '433 patent, which requires using access controls to limit network activity to a particular time window (i.e., time of day). Finally, a POSITA would have found "wherein the power control state is a power state of the wireless modem" (544 patent claim 23) obvious in view of claim 18 of the '433 patent which similarly discusses the "power state of the modem."

B. '578 patent

Claim 1 of the '578 patent is invalid due to obviousness-type double patenting in view of the claimed invention in at least the separately-asserted '976 patent. The '578 and '976 patents share common inventors and are related for double patenting purposes. The '976 patent expires before the '578 patent, and therefore qualifies as a double patenting reference. The '976 patent expires on March 2, 2029, while the '578 patent expires on April 22, 2029. *See Gilead Scis., Inc. v. Natco Pharma Ltd.*, (holding that an earlier expiring patent would "qualify as an obviousness-type double patenting reference for a later-expiring patent"); *Abbvie v. Mathilda & Terence Kennedy Institute*, 764 F.3d 1355, 1373 (finding the crucial purpose of the obviousness-type double patenting doctrine "to prevent an inventor from securing a second, later expiring patent for the same invention" still exists, due, for example, to patents that have "different patent terms due to examination delays at the PTO").

A table showing the overlap in claim language between claim 1 of the '578 patent and claims 1 and 4 of the '976 patent is provided below:

'578 Patent Claim 1	'976 Patent Claim 1
A wireless end-user device, comprising:	A wireless end-user device, comprising:
a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN;	a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN;
a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the at least one WLAN;	a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN;
a non-transitory memory to store a differential traffic control policy applicable to data communicated for Internet service activities using the WWAN modem and the at least one WWAN, but not applicable to data communicated for Internet service activities using the WLAN modem and the at least one WLAN;	
a user interface to allow a user to set one or more of a plurality of aspects of the differential traffic control policy to select one or more applications that are only allowed to utilize the at least one WWAN for Internet service activities when those applications are classified as interacting with a user in the device user interface foreground; and	
one or more processors configured to implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application, including whether the user-settable aspects of the policy only allow the particular application to utilize the at least one WWAN for Internet service activities when the particular application is classified as interacting with a user in the device user interface foreground.	one or more processors configured to determine, for a first end-user application capable of running in a background state and capable of running as a foreground application, whether the application is running in a background state or as a foreground application, and control, via an application program interface (API), application access for Internet service activities provided through the WWAN modem and the WLAN modem, to, based on a first differential traffic control policy, selectively block and allow access by the first end-user application to the WWAN modem at a time when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN,

	<p>wherein the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application.</p> <p>'976 Patent Claim 4</p> <p>4. The wireless end-user device of claim 1, further comprising a user interface to inform the user of the device when there are options to set, control, override, or modify service usage controls that affect the first differential traffic control policy.</p>
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While the claims of the '976 patent contain minor linguistic differences from the independent claim of the '578 patent, none of those differences renders the independent claim of the '578 patent as a whole patentably distinct from the claims in the '976 patent. For example, a POSITA would have found the “wireless end-user device,” comprising “a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the at least one WWAN” and “a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the at least one WLAN” ('578 patent claim 1) obvious in view of claim 1 of the '976 patent, which similarly recites a “wireless end-user device,” comprising “a wireless wide area network (WWAN) modem to communicate data for Internet service activities between the device and at least one WWAN, when configured for and connected to the WWAN” and “a wireless local area network (WLAN) modem to communicate data for Internet service activities between the device and at least one WLAN, when configured for and connected to the WLAN.”

A POSITA would have also found “one or more processors configured to implement an application program interface (API) that allows a particular application to access one or more

aspects of the differential traffic control policy applicable to that application, including whether the user-settable aspects of the policy only allow the particular application to utilize the at least one WWAN for Internet service activities when the particular application is classified as interacting with a user in the device user interface foreground” (’578 patent claim 1) obvious in view of claim 1 of the ’976 patent, which similarly requires one or more processors configured to “control, via an application program interface (API), application access for Internet service activities provided through the WWAN modem” and, “based on a first differential traffic control policy, selectively block and allow access by the first end-user application to the WWAN modem,” “wherein the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application.” In other words, both claims require implementing an API that allows a particular application to access one or more aspects of the differential traffic control policy, including only allowing the particular application to utilize the WWAN for Internet service activities when the application is classified as interacting with a user in the device user interface foreground rather than running in a background state. A POSITA would have also found “a user interface to allow a user to set one or more of a plurality of aspects of the differential traffic control policy” (’578 patent claim 1) obvious in view of claim 4 of the ’976 patent, which also recites “a user interface to inform the user of the device when there are options to set, control, override, or modify service usage controls that affect the first differential traffic control policy.”

Finally, despite similar language missing from the claims of the ’976 patent, a POSITA would have found “a non-transitory memory to store a differential traffic control policy applicable to data communicated for Internet service activities using the WWAN modem and the at least one

WWAN, but not applicable to data communicated for Internet service activities using the WLAN modem and the at least one WLAN” ('578 patent claim 1) obvious in view of claims 1 and 4 of the '976 patent. Indeed, a POSITA would have readily understood that the applicable “differential traffic control policy” recited in claim 1 of the '976 patent would be, or could be, stored in a non-transitory memory located within the claimed “wireless end-user device” and that it would be obvious to do so.

Another table showing the overlap in claim language between claims 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, and 22 of the '578 patent and claims 1, 2, 14, 3, 5, 6, 7, 11, 9, 10, 25, 26, 27, 28, 29, 16, 18, and 20 of the '976 patent, respectively, is provided below:

'578 Patent Claim 3	'976 Patent Claim 1
The wireless end-user device of claim 1, the API further to indicate, to the particular application, one or more network access conditions based on the differential traffic control policy, wherein the one or more network access conditions include a network access condition that indicates the unavailability to the particular application of an Internet data service that is currently available via the WWAN modem to a different application.	indicate to the first end-user application, via an application program interface (API), one or more network access conditions based on the applied first differential traffic control policy, including a first network access condition that indicates the unavailability to the first end-user application, when the first end-user application is classified as not interacting in the device display foreground with the user, of Internet data service that is available via the WWAN modem
'578 Patent Claim 4	'976 Patent Claim 2
The wireless end-user device of claim 1, wherein the one or more processors are further configured to classify that the particular application is interacting with the user in the device user interface foreground when a user of the device is directly interacting with the particular application or perceiving any benefit from the particular application.	The wireless end-user device of claim 1, wherein the one or more processors are configured to classify that the first end-user application is not interacting in the device display foreground with the user when the user of the device is not directly interacting with that application or perceiving any benefit from that application.
'578 Patent Claim 5	'976 Patent Claim 14
The wireless end-user device of claim 1, wherein the one or more processors are further configured to classify that the particular application is interacting with the user in the device user interface foreground based on a	The wireless end-user device of claim 1, wherein the one or more processors configured to classify whether or not the first end-user application, when running, in interacting in the device display foreground with a user perform the classification based at least in part on a

state of user interface priority for the application.	state of user interface priority for the application.
'578 Patent Claim 7	'976 Patent Claim 3
The wireless end-user device of claim 1, the user interface to provide a user of the device with information regarding why the differential traffic control policy is applied to the particular application.	The wireless end-user device of claim 1, further comprising a user interface to provide the user of the device with information regarding why the first differential traffic control policy is applied to the first end-user application.
'578 Patent Claim 8	'976 Patent Claim 5
The wireless end-user device of claim 1, wherein the differential traffic control policy is part of a multimode profile having different policies for different networks.	The wireless end-user device of claim 1, wherein the first differential traffic control policy is part of a multimode profile having different policies for different networks.
'578 Patent Claim 9	'976 Patent Claim 6
The wireless end-user device of claim 8, wherein the one or more processors are further configured to select a traffic control policy from the multimode profile based at least in part on the type of network connection currently in use by the device.	The wireless end-user device of claim 5, wherein the one or more processors are further configured to select a traffic control policy from the multimode profile based at least in part on the type of network connection currently in use by the device.
'578 Patent Claim 10	'976 Patent Claim 7
The wireless end-user device of claim 9, wherein the one or more processors are further configured to, when the type of network connection is at least one type of WLAN connection, select a traffic control policy from the multimode profile based at least in part on a type of network connection from the WLAN to the Internet.	The wireless end-user device of claim 6, wherein the one or more processors are further configured to, when the type of network connection is at least one type of WLAN connection, select a traffic control policy from the multimode profile based at least in part on a type of network connection from the WLAN to the Internet.
'578 Patent Claim 11	'976 Patent Claim 11
The wireless end-user device of claim 8, wherein the differential traffic control policy is the policy for a roaming WWAN network, the multimode profile having a second traffic control policy for a home WWAN network.	The wireless end-user device of claim 1, wherein the one or more processors apply the first differential traffic control policy to one of but not both of a connection to a roaming WWAN network and a connection to a home WWAN network.
'578 Patent Claim 12	'976 Patent Claim 9
The wireless end-user device of claim 1, the one or more processors further comprising a network stack interface in communication with the API.	The wireless end-user device of claim 1, further comprising a network stack interface integrated with the API.
'578 Patent Claim 13	'976 Patent Claim 10
The wireless end-user device of claim 1, further comprising a networking stack, wherein the one or more processors are further	The wireless end-user device of claim 1, further comprising a networking stack, wherein the one or more processors are further

configured to, at an application service interface layer, identify application traffic flows prior to the flows entering the networking stack.	configured to, at an application service interface layer, identify application traffic flows prior to the flows entering the networking stack.
'578 Patent Claim 14	'976 Patent Claim 25
The wireless end-user device of claim 1, wherein the API comprises a network access API.	The wireless end-user device of claim 1, wherein the API comprises a network access API.
'578 Patent Claim 15	'976 Patent Claim 26
The wireless end-user device of claim 1, wherein the API further allows the particular application to access information indicating whether a current connected WWAN is a roaming network or a non-roaming network.	The wireless end-user device of claim 1, wherein the one or more network access conditions indicated via the API to the first end-user application comprises information on whether a current connected WWAN is a roaming network or a non-roaming network.
'578 Patent Claim 16	'976 Patent Claim 27
The wireless end-user device of claim 1, wherein the API further informs the particular application when it is allowed to access Internet data service that is currently available via the WWAN modem.	The wireless end-user device of claim 1, wherein the API informs the first end-user application when it is allowed to access Internet data service that is available via the WWAN modem.
'578 Patent Claim 17	'976 Patent Claim 28
The wireless end-user device of claim 1, wherein the API informs the particular application of one or more network traffic controls that the application is expected to implement.	The wireless end-user device of claim 1, wherein the API informs the first end-user application of one or more network traffic controls that the first end-user application is expected to implement.
'578 Patent Claim 18	'976 Patent Claim 29
The wireless end-user device of claim 1, wherein the API instructs the particular application to transition to a different state.	The wireless end-user device of claim 1, wherein the API instructs the first end-user particular application to transition to a different state.
'578 Patent Claim 19	'976 Patent Claim 16
The wireless end-user device of claim 1, wherein the one or more processors are configured to associate the particular application with the differential traffic control policy based on an application behavior.	The wireless end-user device of claim 1, wherein the one or more processors are configured to associate the first end-user application with the first differential traffic control policy based on an application behavior.
'578 Patent Claim 21	'976 Patent Claim 18
The wireless end-user device of claim 1, wherein the one or more processors are further configured to update the differential traffic control policy based on information received from a network element.	The wireless end-user device of claim 1, wherein the one or more processors are further configured to update the first differential traffic control policy based on information received from a network element.
'578 Patent Claim 22	'976 Patent Claim 20

The wireless end-user device of claim 1, wherein the one or more processors are configured to apply the differential traffic control policy to selectively block network access by the particular application by intercepting open, connect, and/or write requests by the particular application to a network stack.	The wireless end-user device of claim 1, wherein the one or more processors configured to apply the first differential traffic control policy to disallow Internet service activity on behalf of the first end-user application perform a disallowance of Internet service activity by intercepting open, connect, and/or write requests by the first end-user application to a network stack.
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While the claims of the '976 patent contain minor linguistic differences from the dependent claims of the '578 patent, the language is largely identical and none of those differences renders the above dependent claims of the '578 patent as a whole patentably distinct from the claims in the '976 patent.

VI. INVALIDITY UNDER 35 U.S.C. § 112

Headwater has not yet provided a claim construction for many of the terms and phrases that Samsung anticipates will be in dispute. Samsung, therefore, cannot provide a complete list of its § 112 defenses because Samsung does not know whether Headwater will proffer a construction for certain terms and phrases that is broader than, or inconsistent with, the construction that would be supportable by the disclosure set forth in the specification.

Nevertheless, Samsung contends that, at least under Headwater's actual and/or apparent application of the claims, the Asserted Claims are invalid based on inadequate written description and/or a lack of enablement under 35 U.S.C. § 112 ¶ 1, and/or based on indefiniteness under 35 U.S.C. § 112 ¶ 2.

Samsung's aforementioned identification of prior art that anticipates and/or renders obvious particular claim elements, including the attached claim charts, should not be deemed as an admission that any claim element satisfies the requirements of 35 U.S.C. § 112. While Samsung asserts below that a claim is invalid under 35 U.S.C. § 112 (such as because of a failure to

particularly point out and distinctly claim the alleged invention, failure to provide written description support in the specification, and/or failure to enable one of ordinary skill in the art to make and use the alleged invention), Samsung has nonetheless provided prior art disclosures that anticipate or render obvious the claim on the assumption that Headwater will contend those claims are definite, are supported by an adequate written description, and are adequately enabled.

A. Lack of Written Description and Enablement Under 35 U.S.C. § 112 ¶ 1

Certain claims in the Asserted Patents are invalid for lack of written description. Section 112 requires that a patent specification “contain a written description . . . of the manner and process of making and using [the invention] in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.” 35 U.S.C. § 112 ¶ 1. A patent’s written description “must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). The disclosure must “convey to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.* The level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology, but a “mere wish or plan” for obtaining the alleged invention does not satisfy the written description requirement. *Novozymes A/S v. DuPont Nutrition Biosciences APS*, 723 F.3d 1336, 1344 (Fed. Cir. 2013). Put another way, “a description that merely renders the invention obvious does not satisfy the requirement.” *Ariad*, 598 F.3d at 1351. Instead, “all the limitations must appear in the specification.” *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997). Samsung contends that, at least under Headwater’s actual and/or apparent application of the claims, the specifications of at least one or more of the Asserted Patents do not include a sufficient written description supporting the claims. Moreover, Samsung contends

that Headwater's actual and/or apparent application of the Asserted Claims covers a broader scope than is justified and/or supported by the written description provided in the specifications of at least one or more of the Asserted Patents. *Tronzo v. Biomet, Inc.*, 156 F.3d 1154, 1159 (Fed. Cir. 1998); *LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1346 (Fed. Cir. 2005); *ICU Med., Inc. v. Alaris Med. Sys., Inc.*, 558 F.3d 1368 (Fed. Cir. 2009).

Section 112 likewise requires that the specification "enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the" alleged invention. 35 U.S.C. § 112 ¶ 1. A claim is not enabled if, "at the effective filing date of the patent, one of ordinary skill in the art could not practice their full scope without undue experimentation." *Wyeth and Cordis Corp. v. Abbott Labs.*, 720 F.3d 1380, 1384 (Fed. Cir. 2013). "This important doctrine prevents both inadequate disclosure of an invention and overbroad claiming that might otherwise attempt to cover more than was actually invented." *MagSil Corp. v. Hitachi Global Storage Techs., Inc.*, 687 F.3d 1377, 1381 (Fed. Cir. 2012). Samsung contends that, at least under Headwater's actual and/or apparent application of the claims, the specifications of at least one or more of the Asserted Patents do not enable any person skilled in the relevant art to make and use the alleged inventions of the Asserted Claims without undue experimentation.

Furthermore, under Headwater's actual and/or apparent application of the claims, the specifications of at least one or more of the Asserted Patents do not enable the broad scope of the Asserted Claims as Headwater asserts. Samsung contends that Headwater's actual and/or apparent application of the Asserted Claims covers a broader scope than is justified, and certainly broader than is enabled in the specifications. As explained below, the specifications of at least one or more of the Asserted Patents have not enabled a person of ordinary skill in the art at the time of the alleged invention to perform the full scope of all Asserted Claims.

Each of the asserted claims below are invalid because, at least to the extent Headwater contends any of the following limitations should be construed to encompass Samsung's accused instrumentalities, the specifications fail to provide written description and/or an enabling disclosure of at least the following limitations:

1. '701 patent

- **Claims 1, 3, 4, 5, 8, 11-19, 23, 24:** "differential traffic control policy"
- **Claim 1:** "selectively block and allow access by the first end-user application to the WWAN modem at a time when data for Internet service activities is communicated through a WWAN modem connection"
- **Claim 1:** "the access is selectively blocked based on a determination that the first end-user application is running in a background state, and wherein the access is selectively allowed based on a determination that the first end-user application is running as a foreground application"
- **Claim 3:** "provide a user of the device with information regarding why the first differential traffic control policy is applied"
- **Claims 5-7:** "multimode profile"
- **Claim 8:** "second differential traffic control policy that can be set different from the first differential traffic control policy"

2. '184 patent

- **Claim 1:** "classify whether a particular application associated with an Internet service access request, and capable of both interacting with a user in a user interface foreground of the device, and at least some Internet service activities when not interacting with a user in

the device user interface foreground, is interacting with the user in the device user interface foreground”

- **Claim 1, 6, 7, 9, 10, 11, 12, 13:** “differential traffic control policy”
- **Claim 1, 6, 13:** “a differential traffic control policy list”
- **Claim 1:** “based on an application-specific amount of Internet data usage reaching a limit”
- **Claim 2:** “perceiving any benefit from that application”
- **Claim 3:** “classify that the particular application is interacting with the user in the device user interface foreground based on a state of user interface priority for the application”
- **Claim 5:** “delay network activity in association with the first Internet access request until a second Internet access request is received and allowed”
- **Claim 6:** “wherein the user interface is to inform the user of the device when there are options to set, control, override, or modify at least one aspect of the differential traffic control policy and/or the differential traffic control policy list”
- **Claim 8:** “for a time when the WLAN modem is to provide data communication for Internet service activities, not count an application-specific amount of Internet data usage toward the limit”
- **Claim 10:** “dynamically change a determination of whether to apply the differential traffic control policy based on a power state of the device”

3. '578 patent

- **Claims 1-3, 7, 8, 11, 19-22:** “differential traffic control policy”
- **Claim 1:** “user interface to allow a user to set one or more of a plurality of aspects of the differential traffic control policy”

- **Claim 1:** “applications are classified as interacting with a user in the device user interface foreground”
- **Claim 1:** “implement an application program interface (API) that allows a particular application to access one or more aspects of the differential traffic control policy applicable to that application.”
- **Claim 4:** “perceiving any benefit from the particular application”
- **Claim 5:** “based on a state of user interface priority for the application”
- **Claims 8-11:** “multimode profile”

4. '445 patent

- **Claim 1:** “classify, as a first classification, whether data for Internet service activities is to be communicated through the WWAN modem or the WLAN modem”
- **Claim 1:** “classify, as a second classification, whether a particular application associated with an Internet service access request . . . is interacting with the user in the device user interface foreground.”
- **Claims 1, 3-5, 8-15:** “differential traffic control policy”
- **Claim 1:** “block the Internet service access request in a first state of the first and second classifications”
- **Claim 2:** “perceiving any benefit from the particular application”
- **Claims 5-7:** “multimode profile”
- **Claim 8:** “one or more processors are operable to allow the Internet service access request when data for Internet service activities is classified as to be provided through the WWAN modem, and the particular application is not classified as interacting with a user in the device user interface foreground”

- **Claim 16:** “selectively block the Internet service access request by intercepting open, connect, and/or write requests”
- **Claim 19:** “classify that the particular application is interacting with a user in the device user interface foreground based on a state of user interface priority for the application”
- **Claim 20:** “second one or more applications are not subject to a differential network access control that is applicable to the first one or more applications”

5. '224 patent

- **Claim 1:** “for each given application of a plurality of applications on the wireless end-user device”
- **Claim 1:** “associate each given one of the network service usage activities with a service usage control policy dynamically selected from the set of service usage control policies”
- **Claim 1:** “wherein the differential network access control comprises a set of service usage control policies applicable when a network service is available via the at least one wireless modem”
- **Claim 1:** “a first policy that allows the given network service usage activity to currently communicate data with a network destination via the at least one wireless modem”
- **Claim 1:** “a second policy that defers data communication associated with the given network service usage activity until a device state change occurs”
- **Claim 3:** “wherein the dynamically selected service usage control policy for a given network service usage activity is further selected based on whether the application associated with that network service usage activity is currently in the foreground of user interaction”

- **Claim 4:** “wherein the set of service usage control policies further comprises a third policy that blocks data communication associated with the given network service usage activity”
- **Claim 7:** “modem power save state”
- **Claim 10:** “wherein for the second policy that defers data communication associated with the given network service usage activity until the device state change occurs, the device state change comprises a change in user interaction with the wireless end-user communications device”
- **Claim 13:** “wherein the processor is further configured to monitor network service usage behavior for each of the plurality of applications, and wherein the dynamic selection of the service usage control policy for a given network service usage activity is further based on a comparison of the monitored network service usage behavior for the application associated with the given network service usage activity to expected access limits for that application”

6. '976 patent

- **Claim 1:** “classify, for a first end-user application capable of interacting in the device display foreground with a user and capable of at least some Internet service activity when not interacting in the device display foreground with the user, whether or not the first end-user application, when running, is interacting in the device display foreground with the user”
- **Claim 1:** “for a time period when data for Internet service activities is communicated through a WWAN modem connection to the at least one WWAN, apply a first differential traffic control policy to Internet service activity on behalf of the first end-user application, such that Internet service activity on behalf of the first end-user application is disallowed

when the one or more processors classify the first end-user application as not interacting in the device display foreground with the user”

- **Claim 1:** “indicate to the first end-user application, via an application program interface (API), one or more network access conditions based on the applied first differential traffic control policy”
- **Claim 1:** “a first network access condition that indicates the unavailability to the first end-user application, when the first end-user application is classified as not interacting in the device display foreground with the user, of Internet data service that is available via the WWAN modem”
- **Claim 1:** “a second network access condition that indicates the availability to the first end-user application, when the first end-user application is classified as interacting in the device display foreground with the user, of Internet data service that is available via the WWAN modem”
- **Claim 2:** “wherein the one or more processors are configured to classify that the first end-user application is not interacting in the device display foreground with the user when the user of the device is not directly interacting with that application or perceiving any benefit from that application”
- **Claims 1, 3-5, 8, 11-13, 15-20, 23, 24:** “differential traffic control policy”
- **Claims 5-7:** “multimode profile”
- **Claim 7:** “wherein the one or more processors are further configured to, when the type of network connection is at least one type of WLAN connection, select a traffic control policy from the multimode profile based at least in part on a type of network connection from the WLAN to the Internet”

- **Claim 12:** “wherein the one or more processors are further configured to dynamically change the application of the first differential traffic control policy based on a power state of the device”
- **Claim 13:** “wherein the one or more processors are further configured to dynamically change the application of the first differential traffic control policy based on a device usage state”

7. '433 patent

- **Claim 1:** “determine whether to apply the one or more Internet activity access controls with respect to a first Internet access request by or on behalf of the first end-user application, based at least on which of the plurality of wireless network types is to provide data communication for Internet access requests”
- **Claim 1:** “when the one or more Internet activity access controls are to be applied, apply the one or more Internet activity access controls to aggregate network activity for the first Internet access request with network activity for one or more other data communication requests, which are otherwise not associated with the first end-user application, before allowing network activity in association with the first Internet access request”
- **Claims 1, 7, 10:** “differential traffic control policy”
- **Claims 1, 10, 17:** “network service activity control policy set”
- **Claim 2:** “classify whether the first end-user application is interacting with the user in the device user interface foreground, and determine whether to apply the one or more Internet activity access controls based also on the classification of whether the first end-user application is interacting with the user”

- **Claim 3:** “wherein the one or more processors are configured to classify that the first end-user application is interacting with the user in the device user interface foreground when the user of the device is directly interacting with that application or perceiving any benefit from that application”
- **Claim 4:** “wherein the one or more processors are configured to classify that the first end-user application is interacting with the user in the device user interface foreground based on a state of user interface priority for the application”
- **Claim 5:** “wherein the one or more processors are configured to classify that the first end-user application is not interacting with the user in the device user interface foreground when the application is providing or utilizing a background data service”
- **Claims 7-8:** “application list”
- **Claim 13:** “wherein the one or more processors are further configured to dynamically change the determination of whether to apply the one or more Internet activity access controls based on a power state of the device”
- **Claim 14:** “wherein the one or more processors are further configured to dynamically change the determination of whether to apply the one or more Internet activity access controls based on a device usage state”

8. **'544 patent**

- **Claim 1:** “a processor that executes instructions to associate network service usage activity, on behalf of a first device application, and that occurs when the first device application is not in the foreground of user interaction, with a network service usage control policy”
- **Claim 1:** “set an application state indicating whether the first device application, associated with a particular network service usage activity, is in the foreground of user interaction”

- **Claim 1:** “dynamically determine whether to apply the network service usage control policy to the particular network service usage activity, based on the application state and based on a power control state”
- **Claim 2:** “wherein the processor executing the instructions determines that the first device application is in the foreground of user interaction when the user of the device is directly interacting with that application or perceiving any benefit from that application”
- **Claim 3:** “wherein the processor executing the instructions determines that the first device application is in the foreground of user interaction based on a state of user interface priority for the application”
- **Claim 7:** “wherein the power control state is a power state of the device”
- **Claim 22:** “wherein the power control state is a power save state of the device”
- **Claims 1, 4, 5, 6, 11, 12, 18-21:** “network service usage activity”
- **Claims 1, 4, 5, 11-19:** “network service usage control policy”

9. '773 patent

- **Claim 1:** “wherein at least one such service usage control policy specifies that during a time when the current WWAN network busy state indicates network congestion, a selected subset of the background network service usage activities are deferred until network congestion is no longer indicated”
- **Claim 1:** “allow each of the background network service usage activities to access the WWAN during the respective deferred time slot for that background network service usage activity”
- **Claim 1, 2, 16, 17, 18:** “service usage control policy”

- **Claim 9:** “wherein the instructions provided to the processor further cause the processor to select different service usage control policies based at least in part on, in addition to the current WWAN network busy state, monitoring of user interaction with the device”
- **Claim 12:** “wherein to receive respective requests from a plurality of applications comprises receiving the requests through an operating system device service access Application Programming Interface (API), the API allowing applications to indicate a data size for a background network service usage activity”
- **Claim 16:** “service usage behavior analysis”
- **Claim 18:** “wherein the instructions provided to the processor further cause the processor to apply the current service usage control policy for one or more of the background network service activities based on monitoring user interaction with the activity”

Samsung’s investigation of grounds of invalidity based upon failure to meet the written description and/or enablement requirements is ongoing, and Samsung reserves the right to supplement these Contentions.

B. Indefiniteness Under 35 U.S.C. § 112 ¶ 2

35 U.S.C. § 112, ¶ 2 requires that a patent claim “particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112, ¶ 2. Claim terms that fail to inform those skilled in the art “with reasonable certainty . . . about the scope of the invention” fail the definiteness requirement of 35 U.S.C. § 112, ¶ 2. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). Samsung contends that, at least under Headwater’s actual and/or apparent application of the claims, the Asserted Claims of the Asserted Patents fail to distinctly claim what the inventors regard as their alleged invention.

Each of the asserted claims are invalid as indefinite under 35 U.S.C. § 112 because they fail to particularly point out and distinctly claim the subject matter which the applicant regards as his invention. In particular, the following limitations, read in light of the intrinsic evidence, fail to inform those skilled in the art with reasonable certainty about the scope of the claimed inventions:

1. '701 patent

- **Claim 2:** “a user of the device is not directly interacting with that application or perceiving any benefit from that application.”

2. '184 patent

- **Claim 2:** “the user of the device is directly interacting with that application or perceiving any benefit from that application.”

3. '578 patent

- **Claim 2:** “a user of the device is directly interacting with the particular application or perceiving any benefit from the particular application.”

4. '445 patent

- **Claim 2:** “the user of the device is directly interacting with that application or perceiving any benefit from that application.”

5. '976 patent

- **Claim 2:** “the user of the device is not directly interacting with that application or perceiving any benefit from that application.”

6. '433 patent

- **Claim 3:** “the user of the device is directly interacting with that application or perceiving any benefit from that application.”

7. '544 patent

- **Claim 2:** “the user of the device is directly interacting with that application or perceiving any benefit from that application.”

Samsung’s investigation of grounds of invalidity based upon indefiniteness is ongoing, and Samsung reserves the right to supplement these Contentions.

VII. INVALIDITY UNDER 35 U.S.C. § 101

Samsung contends that all claims of the Asserted Patents are invalid under 35 U.S.C. § 101 because the claims are not directed to patent-eligible subject matter. Samsung’s contentions that the Asserted Claims are invalid under 35 U.S.C. § 101 do not constitute, and should not be interpreted as, admissions regarding the construction or scope of the claims of the Asserted Patents, or that any of the claims of the Asserted Patents are not anticipated or rendered obvious by prior art.

35 U.S.C. § 101 provides that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor[.]” Because abstract ideas form the “basic tools of scientific and technological work,” they are unpatentable subject matter under 35 U.S.C. § 101. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014). The Supreme Court provided a two-part test for assessing patent eligibility under Section 101. *See generally id.*

Under the first step of *Alice* (“Step One”), a court must decide whether the claims are directed to ineligible subject matter, such as an abstract idea. *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1326 (Fed. Cir. 2017); *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015). To do so, a court examines the claims to determine whether their “character as a whole,” or their “focus,” is an abstract idea. *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016). This examination entails “identify[ing] and defin[ing]

whatever fundamental concept appears wrapped up” in the claims. *Accenture Glob. Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1341 (Fed. Cir. 2013) (internal quotation marks and citations omitted). Once ascertained, the court then determines whether that character is “directed to excluded subject matter,” such as an abstract idea. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (internal citation omitted). This inquiry often asks whether the claims’ character is directed to “a specific means or method” for improving technology or whether it is simply directed to an abstract end-result. *RecogniCorp*, 855 F.3d at 1326. If the claims are not directed to an abstract idea, the inquiry ends. *Thales Visionix Inc. v. United States*, 850 F.3d 1343, 1349 (Fed. Cir. 2017). To resolve this question, “it is often helpful to ask whether the claims are directed to ‘an improvement in the functioning of a computer,’ or merely ‘adding conventional computer components to well-known business practices.’” *Affinity Labs. of Texas, LLC v. Amazon.com Inc.*, 838 F.3d 1266, 1270 (Fed. Cir. 2016) (quoting *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1338 (Fed. Cir. 2016)). “Generalized steps to be performed on a computer using conventional computer activity are abstract[.]” *RecogniCorp*, 855 F.3d at 1326 (internal quotation marks omitted). And “[c]laims directed to generalized steps to be performed on a computer using conventional computer activity are not patent eligible.” *Affinity Labs.*, 838 F.3d at 1270 (citing *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1348-49 (Fed. Cir. 2015)).

If the claims, as here, are directed to one or more abstract ideas, then the court advances to the second step of *Alice* (“Step Two”), where the claim elements must be scrutinized “both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Enfish*, 822 F.3d at 1354 (quoting *Alice*, 573 U.S. at 217). At Step Two, the court searches for an “‘inventive concept’ sufficient to ‘transform the nature of the claim into a patent-eligible application.’” *RecogniCorp*,

855 F.3d at 1327 (quoting *Alice*, 573 U.S. at 217). To save a patent at Step Two, an inventive concept must be evident in the claims. *See Alice*, 573 U.S. at 221; *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016). The “inventive concept” must also “involve more than performance of well-understood, routine, and conventional activities previously known to the industry.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 73 (2012); *Certain Elec. Devices*, 2020 WL 6441422 at *4. The Federal Circuit’s “precedent is clear that merely adding computer functionality to increase the speed or efficiency of the process does not confer patent eligibility on an otherwise abstract idea.” *Ericsson Inc. v. TCL Commc’n Tech. Holdings Ltd.*, 955 F.3d 1317, 1330 (Fed. Cir. 2020) (citing *Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1370 (Fed. Cir. 2015)). In addition, limitations that simply restrict the invention to a single field of use or merely add “token post-solution” requirements also fail to impart patentability. *Bilski v. Kappos*, 561 U.S. 593, 612 (2010).

All Asserted Claims are invalid under 35 U.S.C. § 101 because they fail to claim patent-eligible subject matter, including the following claims:

- Claims 1-25 of the ’701 patent;
- Claims 1-20 of the ’184 patent;
- Claims 1-22 of the ’578 patent;
- Claims 1-20, 22-26 of the ’445 patent;
- Claims 1-17 of the ’224 patent;
- Claims 1-29 of the ’976 patent;
- Claims 1-20 of the ’433 patent;
- Claims 1-8 and 11-23 of the ’544 patent; and

- Claims 1-14 and 16-20 of the '773 patent.

A. Alice Step One: The Asserted Claims Embody Abstract Concepts

At Step One, the court must “identify and define whatever fundamental concept appears wrapped up in the claim.” *Accenture Glob. Servs.*, 728 F.3d at 1341.

All asserted independent claims are substantially similar and related to optimizing and/or prioritizing traffic and resources of mobile phones. At the most basic level, the Asserted Claims are linked to the same abstract idea of prioritizing information flow and resource allocation, which is a long prevalent human activity. Because the Asserted Claims fail to offer anything more than using generic pre-existing computer functionality to carry out the abstract idea of prioritizing information flow and resource allocation, the Asserted Claims are abstract at Step One. *See, e.g.*, '976 pat. at 2:66-3:8 (“[T]hese implementations, or any other form that the invention may take, may be referred to as *techniques*. . . . Unless stated otherwise, a component such as a processor or a memory described as being configured to perform a task may be implemented as a *general component* that is temporarily configured to perform the task...”).

B. Alice Step Two: The Asserted Claims Do Not Recite an Inventive Concept

For a claim to be patent eligible under *Alice* Step Two, “an inventive concept must be evident in the claims,” *RecogniCorp*, 855 F.3d at 1327, and it must provide “significantly more” than the abstract idea itself, *BSG Tech LLC v. Buyseasons, Inc.*, 899 F.3d 1281, 1289-90 (Fed. Cir. 2018). In performing this analysis, a court must scrutinize the claim elements ‘both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.’” *Enfish*, 822 F.3d at 1354 (quoting *Alice*, 573 U.S. at 217). Elements that are “well-understood, routine, conventional,” or “purely functional” cannot confer patent-eligibility. *Alice*, 573 U.S. at 225-26 (citation omitted). Admittedly, the claims relate to the same “general communication device” described in generic

terms in the specification and the claimed process carried out on a generic processor is performed using well-known standards. Thus, there is no particularized solution to any problem, and nothing that can pass Step 2 of *Alice*.

The Asserted Claims recite only conventional, well known components and functionalities, and do not recite any purportedly novel arrangement of those components. As set forth in Exhibits A-01 through I-11, Exhibits A-A through I-I, and/or through AAPA, individually and/or collectively, these features were well known, routine, and/or conventional, and known in the prior art as set forth herein.

VIII. Document Production

Pursuant to Patent Rule 3-4, Samsung is concurrently producing the prior art identified in these Invalidity Contentions, but Samsung is not required to produce the prior art in the file histories of the Asserted Patents.

In addition, based on investigations to date, Samsung is concurrently producing and/or making available for inspection source code, specifications, schematics, flow charts, artwork, formulas, or other documentation sufficient to show the operation of any aspects or elements of the Accused Instrumentalities identified by Headwater in its P.R. 3-1(c) chart.

Samsung reserves the right to supplement these productions with additional documentation, in accordance with the Federal Rules of Civil Procedure, the Local Rules, the Court's orders and other applicable rules and statutes.

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Respectfully submitted,

By: /s/ Jared Hartzman
Ruffin B. Cordell
TX Bar No. 04820550
Michael J. McKeon
DC Bar No. 459780

mckeon@fr.com
Jared Hartzman (*pro hac vice*)
DC Bar No. 1034255
hartzman@fr.com
Joshua Carrigan (*pro hac vice*)
VA Bar No. 96911
carrigan@fr.com
FISH & RICHARDSON P.C.
1000 Maine Avenue, SW, Ste 1000
Washington, D.C. 20024
Telephone: (202) 783-5070
Facsimile: (202) 783-2331

Thad C. Kodish
GA Bar No. 427603
tkodish@fr.com
Benjamin K. Thompson
GA Bar No. 633211
bthompson@fr.com
Nicholas A. Gallo (*pro hac vice*)
GA Bar No. 546590
gallo@fr.com
Steffen Lake (*pro hac vice*)
GA Bar No. 512272
lake@fr.com
FISH & RICHARDSON P.C.
1180 Peachtree St. NE, Fl. 21
Atlanta, GA 30309
Telephone: (404) 892-5005
Facsimile: (404) 892-5002

Leonard E. Davis
TX Bar No. 05521600
ldavis@fr.com
Andria Rae Crisler
TX Bar No. 24093792
crisler@fr.com
FISH & RICHARDSON P.C.
1717 Main Street, Suite 5000
Dallas, TX 75201
Telephone: (214)747-5070
Facsimile: (214) 747-2091

John-Paul R. Fryckman (*pro hac vice*)
CA Bar No. 317591
FISH & RICHARDSON P.C.

12860 El Camino Real, Ste. 400
San Diego, CA 92130
Telephone: (858) 678-5070
Facsimile: (858) 678-5099

Melissa R. Smith
State Bar No. 24001351
Melissa@gillamsmithlaw.com
GILLAM & SMITH, LLP
303 South Washington Avenue
Marshall, Texas 75670
Telephone: (903) 934-8450
Facsimile: (903) 934-9257

Andrew Thompson (“Tom”) Gorham
State Bar No. 24012715
tom@gillamsmithlaw.com
GILLAM & SMITH, LLP
102 N. College, Ste. 800
Tyler, Texas 75702
Telephone: (903) 934-8450
Facsimile: (903) 934-9257

Grant K. Schmidt
Texas Bar No. 24084579
gschmidt@hilgersgraben.com
Jon Hyland
Texas Bar No. 24046131
jhyland@hilgersgraben.com
Theo Kwong
Texas Bar No. 24087871
tkwong@hilgersgraben.com
HILGERS GRABEN PLLC
7859 Walnut Hill Lane, Suite 335
Dallas, Texas 75230
Telephone: (469) 751-2819

*Attorneys for Defendants
Samsung Electronics Co., Ltd. and
Samsung Electronics America, Inc.*

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing was served on counsel of record for Plaintiff via electronic mail on September 6, 2023.

/s/ Jared Hartzman

Jared Hartzman